

Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. LXXX.*

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SECTION V.

Where both the longer and shorter sides of the shaft are of a loose character it will be necessary to make the ends of the frame by which it is supported project a considerable distance into the ground, and where neither the longer nor shorter sides show any preference in this respect it is not unusual to lay two bearing cribs, the one upon the other, the shorter pieces of the one projecting well into the hanging and lying walls, and the longer pieces of the second crib projecting well into the shorter sides of the shaft. This arrangement is sometimes resorted to where, although the ground is comparatively firm, the great weight of the timbering to be supported necessitates that the bearing crib should be stronger than usual. It is better to strengthen the bearing crib in this manner by laying two or more cribs upon each other than by making the frames out of timber of larger dimensions, which may be not only expensive, but also unnecessarily diminish the available area of the shaft.

Another very suitable mode of supporting heavy timbering is to place at each side of the shaft two or more bearing stempels, notched and wedged firmly into the hanging and lying walls. Upon these the bearing frame or crib rests, the shorter sides of the frame resting directly on the bearing stempels. Neither the side or wall of the crib project into the ground, the crib being simply wedged into position against the sides of the shaft.

The lining of a shaft by means of a combination of bearing and ordinary cribs, which we shall term frame or crib timbering, takes place in two ways, which we shall designate as propped frame timbering and solid crib timbering.

1. PROPPED FRAME TIMBERING.—This description of timbering is applicable in those cases where the ground, though not compact, possesses sufficient cohesion as to stand open for some length of time, and when the pressure from the sides can be sufficiently resisted by simple piling or covering placed behind the frames. As we shall show, the capability of this description of framing for resisting the side pressure can be varied within considerable limits. The insertion of this kind of timbering is effected in distinct divisions, or "fields," of timbering. The sinking of the shaft is carried a field length, which varies from 6 to 9 ft. Here the bearing cribs, or frames, are inserted in some cases where the field is of considerable length, and consequently where a somewhat greater weight is thrown on the bearing crib. The latter may be supported on bearing stempels, which may be placed either only across the shafts close to the two short sides, or a third bearing stempel is placed to support the bearing crib immediately beneath the line of cross bearers across the middle of the shaft; or, lastly, only two bearing stempels may be placed beneath the bearing crib—one beneath the line of the cross bearers, and the other beneath the side piece of the frame, which with the cross bearer includes the larger division of the shaft (set apart for the winding shaft), the remaining smaller division forming the travelling shaft. The bearing crib, or frame, may be made according to any of the plans above given. At a height of about a yard above the bearing frame an ordinary frame (the ends of which do not project into the sides) is placed, and supported directly from the bearing frame by means of props, which are hollowed out at the upper end, so as to fit the circular shape of the wood of the frame. Where the wood is sawn on all four sides, and the joints between the long and short sides horizontal, only four props, perhaps, may be used. It will be better, however, especially where round wood is used, to have two props near each corner. In addition to the corner props it is not unusual to place a prop between the wall pieces, in the same plane as the cross bearers, and in the case where the wall pieces are formed in two halves the rigidity of the timbering is greatly increased by placing vertical props between the wall pieces at such places, similarly as we have advised in the case of the use of cross bearers. Above this frame set a second frame set (with the joints between the wall and side pieces placed vertically) is fixed a support by props from the last crib. At a further height of a yard above the last frame another frame is placed, and likewise supported by props from the last frame. In this manner the space up to the last bearing crib is built, with frames at regular distances of about a yard from each other by means of vertical props.

Dependent on the nature of the ground is the distance by which the bearing cribs are placed apart, and the number of ordinary frames which intervene between two bearing frames. The distance varies from 2 yards, where a bearing crib and an ordinary frame alternate, to 20 yards, where a bearing crib is inserted with every 8 or 10 ordinary cribs. It is evident that when one strong bearing crib (formed of two or three frames placed in close contact upon each other) can be inserted, and made to do the duty of several bearing cribs placed at some distance apart, a great saving of both labour and time in cutting the notches is effected; and hence in many cases it may be found advisable to insert fewer bearing cribs, but to replace them by the use of bearing stempels, placed at suitable intervals to support the ordinary frames and cribs. The distance of these stempels apart will depend partly on the nature of the ground and partly on the weight of the timbering. Where the ground is generally of a loose or soft character, so that the bearing stempels have not a sufficiently firm support (where the stempels are likely to sink somewhat through the ground), which might readily occasion the loosening of the timbering, recourse must be had to some artificial means of supporting the bearing stempels. This is generally effected by making an opening in the sides where it is intended to insert the ends of the stempel. This opening being made to a considerable depth. In order to prevent the stempel being forced into the ground in the direction of its length the end or face of this opening is covered with a strong thick board, which thus increases considerably the area against which the end of the stempel thrusts. In like manner to increase the bearing surface sufficiently, the bottom of the opening is covered with a broad block of wood, on which the end of the stempel rests, preventing its sinking down, and decreasing the liability of the stempel pushing or breaking off any of the ground beneath. The sides and the top of the opening are filled with wooden blocks or wedges, cut to size and driven tight in. It may happen that, although generally the sides of the shaft are of a loose and soft character, there may be some places where the ground is sufficiently compact to offer a suitable place for the insertion of the ends of the bearing stempels. These should be made use of, though the disadvantage of having the bearing stempels and cribs at irregular intervals may be incurred.

The distance of the bearing cribs apart, as we have already mentioned, is dependent on the character of the ground with respect to its compactness or hardness, since they are intended essentially to bear a vertical weight (that of the timbering). The distance of the ordinary cribs apart, however, is regulated essentially according to the side pressure, which is dependent partly on the more or less compactness of the ground, partly on the existence of fissures, &c. This varies usually between 1 ft. and 4 ft., and of course the length of the props will vary to correspond, the frames being placed nearer together the greater the pressure.

A not inconsiderable support for the timbering is obtained by driving wedges and blocks of wood between the various frames (both bearing and ordinary frames) and the sides of the shaft. Indeed this wedging of the ordinary frames is necessary in order to secure them in a position vertically beneath each other. Where

the shaft is vertical, which we have supposed, the position of each and every timber should be controlled in a vertical or horizontal direction by means of a plumb line and spirit level, so that each frame shall be in a perfectly horizontal position, and the corners vertically beneath each other. Where the shaft is inclined the position of the various frames will have to be controlled chiefly by string lines from various fixed points. These precautions should be attended to during the driving of the wedges, &c., behind the frames. Where, however, the ground breaks so short, or is so loose, that wedging ensures but an insufficient security against the motion of the ordinary frames, it is usual to connect these among each other, and with the bearing frames, by means of stringing laths or bars, which are nailed to the various frames.

Where the ground is comparatively firm, so that the frames can be placed at some considerable distance apart, a simpler mode of inserting prop frame timbering is to make the ends of the wall pieces project alternately with those of the side pieces, the projecting ends being notched respectively into the short sides and the walls.

In order to protect the shaft from the loose ground falling into it piles are driven in behind the frames, the space between the sides of the shaft and the piles being well filled with attle packing, or the like, as we have already described in the case of level timbering. The length of the piles, or covering wood, should be so arranged that, although it may extend over more or less frames, the place where one set of piles terminates, and another (either flush with it or inserted between it and the frame) commences, shall be behind a frame set, where possible behind a double frame (where an ordinary frame rests on the bearing crib, or stempel). The piles are so arranged that the upper ends of a lower set are between the crib and the lower ends of the upper set of piles, an arrangement which facilitates the withdrawal and the replacing of any particular pile.

From the above description of prop crib timbering of a shaft it will be evident that, under various circumstances, this kind of timbering will require some means of strengthening or stiffening it.

This method of lining shafts is often resorted to in the neighbourhood of Liège, where the shafts are often of considerable size, from 18 feet to 20 feet long and about 10 feet wide. The wall pieces are inserted in a notch in one of the shorter sides, and driven down against a ledge on the other side, which is cut so as to allow of the insertion of the second end after the first end has been inserted. A flat piece of wood is usually placed at the end of the notch, against which the end of the stempel, or wall piece, bears; the other end is tightened up with wooden wedges. The short side pieces are inserted in a notch from 1 to 1½ in. deep cut in the inner side of the wall pieces; the notch, however, does not extend the whole depth of the wall piece, and the side pieces, which are of the same thickness as the wall pieces, are cut so that a portion of the end of the side piece, of the same depth as the notch, projects 1 in. to 1½ in., fitting exactly into the notch, and leaving the upper and the lower sides of the side pieces flush with the upper and lower sides of the wall pieces. The frames are divided into two pretty nearly equal parts by means of cross bearers, which are fitted in exactly the same way as the shorter pieces; and by means of wedges between the ends and sides of the framing, and the sides of the shaft, each frame is fixed in a perfectly horizontal position, and plumb beneath the upper frames. The frame is formed of timber from 12 to 16 in. square, and forms two equal and pretty nearly square divisions. Close to the corners of each division two vertical props are inserted; the one between the wall pieces, and the other between the side pieces, or the cross bearers, as the case may be. The props are rectangular in section, and of the same length as the distance apart between two frames, centre to centre. The props are so cut, however, that for about two-thirds their thickness the back portion is only of the same length as the distance between the top side of one frame and the under side of the next frame above, between which the prop thus fits, the projecting ends bearing against the inner sides of the frames for half the depth of the latter, and are here fastened to the frames by means of a couple of nails or pegs. If the character of the ground is such that there is any liability of portions falling into the shafts, and also in order to prevent anything which is being raised or lowered in the shaft from catching against the upper or under side of the frames, the inside of the frames are covered with stringing planks about 5 in. by 2 in. in section, placed from 6 to 12 inches apart, centre to centre, as may be advisable. These stringing planks or laths are not necessarily of the same length; they must be, however, some exact multiple in length of the distance between two successive frames, and their ends should meet nearly flush with each other against some of the frames. It is desirable not to have the ends of these stringing planks all fastened at one frame; but, so to speak, to make them to break joint with each other, which will thus have the tendency to make the framing more rigid. Wherever a stringing plank crosses one of the frames it is fastened to it by means of five nails or pegs. The stringing planks which are fastened to the cross bearers, and which form the partition between the two portions of the shaft, should be placed close together, so as to prevent anything falling out of one shaft into the other, and are, besides, usually caulked. The stringing planks round the shaft lessen the liability of anything falling down the shaft catching against the frames and breaking them.

In some of the Silesian mines where the shafts are divided into three compartments, two larger ones of about the same size for winding, pumping, or the man-engine, and a smaller one for the travelling ladders, this method of lining the shafts is often resorted to, especially where the strata are comparatively compact, changing into solid crib timbering (to be next described), where the ground is very loose and conglomeratic. According to Sichel the side pieces are placed upon the wall pieces, and according to Ponson the wall pieces are placed resting on the side pieces. The ends of the props are sawn square off, and not notched, although round timber is generally used for the framing, the props being placed exactly in the corner over the joint. The short side pieces project somewhat into the longer sides or walls of the shaft, into notches purposely prepared for them. When several lengths of framing have been inserted two long stringing beams of round timber are placed against each wall piece, the two corresponding stringing beams on opposite walls being strutted apart by horizontal cross beams, the ends of which are notched or hollowed out so as to fit round from the stringing beams. In the corners between the wall pieces and the cross bearers long planks of wood stringing planks are attached to the wall pieces, and likewise close to and at right angles to these are placed other stringing planks, thus forming a sort of corner or angle timbering, which serves as a sort of guide to the winding frame, and at the same time to strengthen the lining. Where the ground is liable to break short the back of the frames are lined in the usual manner, either with flat rectangular piles or with the small ends of round timber.

When the shaft is of comparative length a moderate side pressure will suffice to bend the centre of the wall pieces considerably inwards. This is generally avoided by means of the cross bearers we have before mentioned.

The arrangement of this kind of timbering, whether provided with cross bearers between the wall plates, consists simply of rectangular framework, so that any pressure is opposed directly only in three principal directions—i.e., vertically upwards or downwards, and normal to the plane of the hanging and lying walls, and also normal to the plane of the sides. Any pressure, therefore, which acts in other than these directions is opposed by a resultant resistance, compounded of the resistances in the principal directions, and the friction of the various joints and surfaces of contact of the timbering and the ground. As will be known to every trained engineer, any combination of framing exhibiting only four-sided figures is virtually moveable, as if the connection of the various timbers formed universal joints. It will be evident that a given pressure in certain directions would tend to alter the form of the timbering without throwing any severe breaking or crushing strain on the separate pieces. To avoid the motion of any part of the timbering which might readily lead to a collapse, it is necessary, therefore, to introduce some triangular figures amongst the timbering, and this

is done by means of struts, which acting sometimes in an inclined upward and sometimes in an inclined downward direction are called by German miners lifting and pressing struts.

Their principal object is to oppose any tendency of one side of the timbering to alter its position with respect to the opposite side, more especially that of the hanging side with respect to the lying side, so that these struts are inserted principally on the shorter sides. One of the most usual examples of the use of struts for this kind of timbering is to place the struts from the wall piece of a frame to the wall plate on the opposite side of the next upper frame or lower frame, as the case may be. Where the shaft is not perfectly vertical, for example, from the wall piece on the lying side of a frame to the wall piece on the hanging side of the frame next above. Where the frames are placed somewhat close together the strut may extend, not to the first, but the second or third set of framing above. These struts are generally not in the same plane with but close to the side piece, more rarely do they extend from corner (between vertical prop and side piece) to corner. Such an arrangement is intended chiefly to prevent a sinking or lowering of the hanging side, with respect to the lying side. It is more usual, however, to make the direction of the struts alternate first upwards towards the hanging side, then the next upwards towards the lying side, without crossing each other. The direction of the struts on both sides between two given frames is also usually not the same, so that in profile they would appear to cross each other. It is by no means unusual, however, for a long strut to extend from the wall piece on the lying side upwards to the wall piece on the hanging side, against which two short props are strutted inclined in an opposite direction to the longer strut. The joint of these struts with the other timbers is usually made by hollowing out the ends to fit the circular form of the round timber, against which they are driven tight up. The upper ends of these struts serve to exert an upward pressure against the frame resting upon it, and the lower end exerts a downward pressure, so that the former opposes any tendency of that portion of the timbering to sink down, whilst the latter opposes any tendency of the timber to rise.

SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE INSTITUTE OF MINING ENGINEERS.

The usual monthly meeting of members was held at the Geological Museum, Dudley, on Monday, Mr. W. NORTH, the president, being in the chair, and Mr. H. JOHNSON, the vice-president, in the vice-chair.

The SECRETARY (Mr. Alexander Smith, C.E.) read the minutes of the previous meetings, from which it appeared the council were negotiating with the Mechanics Institute in order to obtain a large room connected with the Geological Museum, in which to form a Mining Museum. Three new members were elected, and the consideration of the excursion to the Paris Exhibition was deferred till the August meeting.

The following paper was read:—

VENTILATION: CAUSES OF SPONTANEOUS COMBUSTION, AND REMARKS ON FALLS OF ROOFS IN UNDERGROUND WORKINGS. BY MR. WILLIAM WARDLE.

I may safely affirm that the above subjects are three of the most important which claim the attention of the mining engineer. Ventilation by means of the furnace was, until recently, the only really successful method, and various forms and constructions of furnaces must have come under the notice of most of the members of this Institute, each one of these forms differing considerably in its effectiveness and economy. Amongst the least effective we find those placed at the top of the upcast shaft fed either by fresh air or the return. Next in order of effectiveness are those placed in the side of the shaft, or in a lamp, some distance away from the bottom, and the next in order are those placed in a lamp or on an open grate at the pit bottom; and lastly, the most effective of all furnaces are those placed in a drift or drifts a short distance from the bottom of the upcast shaft, the drifts varying in length and form according to circumstances. The steam jet has also been tried to a great extent, but cannot compare with the furnace either in efficiency or economy; indeed, until the comparatively recent invention of the ventilating fan, the furnace, as before remarked, was the only really successful motor. The ventilating fan, however, is becoming more popular every year, especially at collieries, where the underground workings are very extensive, as in case of emergency the ventilation can be doubled by simply increasing the speed of the fan. However, they have their defects and disadvantages, and under some circumstances the furnace is undoubtedly the most convenient, and possibly the most economical.

FURNACE VENTILATION.—The power obtained by a furnace is ascertained by finding the difference between the weight of the air in the downcast and upcast shafts, which is called the motive column. Atkinson's rule for finding the weight of a cubic foot of air at any temperature and under any pressure is:—Multiply 1.293 by the height of the barometer in inches, and divide the product by 459 + the temperature by Fahrenheit's thermometer. The quotient will be the weight sought. When the weight of a cubic foot of air has been found by this rule, the weight in the downcast being multiplied by its depth in feet, will give the total weight on each square foot, and in like manner the weight of a cubic foot of air in the upcast being multiplied by its depth, will give the total pressure on each square foot in the upcast. It will be seen that the pressure on each square foot in the downcast is considerably in excess of the pressure in the upcast shaft. This is owing to the greater density of air in the downcast shaft, and if this difference is multiplied by the number of cubic feet of air circulating through the mine per minute, and this result divided by 33,000, we have the horse-power of the furnace. It will be seen by the above rule that the greater the depths of the shafts and the higher the temperature of the upcast, the greater will be the quantity of air circulating per minute. Furnace ventilation is also as the ratio of the difference in the square roots of the temperature in each shaft, and it also increases as the square root of the depth from the surface, so the higher the temperature in the upcast shaft, and the greater the depth at which the furnace is placed, the greater will be its effective power; consequently, a furnace will produce double the quantity of air at 200 yards depth than it will at 50 yards depth, all other things remaining the same. It will also be seen by rules laid down a little further on that dividing or splitting the air greatly increases the total quantity circulating through the mine. The position and size of a furnace have a considerable influence on the quantity of air set in circulation. I invariably find that when the furnace is placed about 30 yards from the bottom of the upcast shaft it gives the best results, and the drift or tunnel from the furnace to the shaft should rise about 4 in. per yard. (Sketches were exhibited showing the form, size, and details of a pair of furnaces put in by the author last year at the Rainford Collieries.) When I took the management of these collieries I found the furnace was badly constructed, and far too small to give an adequate amount of ventilation for the workings, the greater part of the workings being about 3 ft. 6 in. wide, and the length 9 ft., giving a total area of 31 ft. 6 in. square surface; whereas, had this furnace been 5 ft. 3 in. wide and 6 ft. long, which would have been exactly the same area of grate surface, it would have set one-third more air in circulation, as the air that should have passed over the fire to be heated escaped through the apertures at the far end of the grate, as scarcely any fire could be kept on the bars through the grate being such an enormous length. I also found I had to sink the upcast shaft 120 yards deeper to another mine, but could not commence these operations until the furnace was removed, as it was built close to the pit eye, and the flames from it passed direct into the shaft, which would have been very dangerous to sinkers and others descending or ascending past it.

I at once commenced lengthening the archway from this furnace, and carried it a distance of 107 ft. from the shaft, increasing its area according to progression. At this point I put in a small pair of furnaces, which greatly increased the ventilation. I completed these new furnaces before taking out the old ones to obviate the necessity of interfering with the ventilation or the working of the

* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergsrath Dr. VON GONNOR, Director of the Royal Bergakademie, Clausthal, the Harz, North Germany.

pit. The total quantity of air produced by the old furnace was 20,000 cubic feet per minute, and the consumption of coal was 3733 lbs. per minute, or 6697 cubic feet of air per lb. of coal consumed. The new furnaces are giving 45,000 cubic feet of air per minute, which is more than double the quantity of the old one, and the consumption of coals is 4358 lbs. per minute, giving 10,325 cubic feet of air per lb. of coal consumed. It will thus be seen that the construction and position of a furnace has a great deal to do with its efficiency.

By the rule already given the new furnaces are found to yield 1266 horse-power per lb. of coal used. The depth of both down-cast and up-cast shaft was 240 ft. The temperature was—of down-cast, 50°; and of up-cast, 190° Fahr. The consumption of coal was 4358 lbs. per minute, and the cubic feet of air per lb. of coal 10,325. The air per minute was 45,000 cubic feet, and the horse power expended 5.51. You will observe that both shafts are very shallow; had they been four times the depth, or 300 yards, the same furnaces would have given double the quantity of air, all other things remaining the same. This quite upsets the old idea which was prevalent in this and other districts—building what are termed snatches at the top of the up-cast pit instead of at the bottom.

The following is an explanation of the construction of the new furnaces. They consist of an outside shell or arch of brickwork, three rings thick, around the outside of this, or between it and the solid strata, is a layer of sand 12 in. in thickness, well packed to keep the heat from igniting the strata. Before the sand was put in it was screened through a very fine riddle to keep out all combustible substances, such as small pieces of coal, wood, or cotton waste, &c. Under the arch is another arch two rings thick, both arches being carried to the up-cast shaft. Between these two arches there is a space of 4 in. left for air to circulate through, and so keep the upper arch cool; and here and there a tie brick is put in to prevent the heat from expanding the inner arch. Under these two arches other two smaller ones are burned, one over each each fire-grate, and these are carried back 15 ft. There is also a travelling road along one side of the furnaces to facilitate the examination and repair of the furnace or drift at any time, there being an iron door fixed at either end to prevent the air from passing through or the heat from striking back. These doors are usually kept locked. Each fire-grate is 6 ft. long and 3 ft. 7 in. wide, and at the front of each grate is a pair of doors similar to those in use in steam-boilers. Under each grate is placed a wrought-iron pan, the full length and width of the grate itself, and about 8 in. deep; about 6 in. of water is constantly kept in these pans by means of pipes from the down-cast pit, so that all ashes and hot cinders dropping into them are immediately cooled. The return air enters the up-cast shaft about 7 yards above the furnace-drift, consequently if there is any noxious gas in the return air it does not come into contact with the flame of the furnace. Where furnace ventilation is adopted wooden curbs are quite out of date for up-cast shafts, and are not to be recommended. Gentlemen, before going into the natural laws affecting the ventilation of mines, I will make a few remarks on the composition of the atmosphere and its effect on gob fires and the roof of a mine. The atmosphere is a mixture, and not a chemical compound, and its ingredients are oxygen and nitrogen, and carbonic acid is also present, and forms about one part in 2500 parts of the atmosphere. Watery vapour is also contained in the atmosphere, arising partly from combustion, but chiefly from the air coming in contact with the surface of the sea. We also get a larger amount of this vapour at one season than another. In spring and summer we get the most, for in the summer months the atmosphere contains about four times the amount of vapour that it contains in the winter months, this being easily accounted for by the air's temperature at the earth's surface being considerably higher in summer than in winter.

FALLS OF ROOFS IN UNDERGROUND ROADWAYS.—A question that has been asked by mining engineers for a number of years is—why are there more falls of roof in the underground roadways at night time than in the day time? I have no doubt that most of the members of this Institute have seen in many instances such like occurrences, especially in the thin seams of this district, such as the Brooch and Heathen coals, where the roof is unusually broken or of a tender nature. My theory on the above is that there is a certain amount of heat given to the earth every day, especially, as before stated, during the summer months, and this is given off from the earth by radiation every night, or the temperature at the earth's surface would soon be so great that nothing could live upon it. This can readily be seen by observing a grass field after a very warm day, as early next morning the field will seem as though a very heavy shower of rain had fallen upon it; this is simply the watery vapour discharged from the atmosphere during the night. Exactly in the same way this watery vapour is condensed from the atmosphere on the roof and sides of the underground roadways as the air flows through them; it has but little effect upon the unbroken or solid mass of strata, as the temperature of this is maintained by its inner sources of heat, but any fractured or broken parts of the roof or sides will soon fall to a low temperature, as being separated from the solid mass its capacity for storing heat is not so great, and, as previously shown, the air deposits its excess of moisture upon these cold and broken surfaces, exactly as steam from a boiler is condensed by coming in contact with any cold substance. It may not be out of place to here give two illustrations showing the liability of the broken or fractured roof to fall to a lower temperature than the solid mass.—1. Take a small quantity of gravel and place it upon a bed of grass at night, next morning it will be found very much moistened with the watery vapour of the atmosphere, but the solid mass of gravel from whence it was taken will be comparatively dry, and as the small quantity is cut off from the sources of heat, and isolated from the greater mass, it will the more readily fall to a low degree of temperature.—2. Shavings of wood become more moist than a block of wood, because the shavings being thinner bodies they do not derive the same amount of heat by conduction. The surface of a block of wood continually draws off heat from its internal parts, but the shavings having no such sources to draw upon would cool far more rapidly than the block.

SPONTANEOUS COMBUSTION (usually called "Fire Stink.")—In the first place I will make a few remarks on the principal causes of spontaneous combustion in underground workings. It is believed by many mining engineers that spontaneous combustion is chiefly caused by the oxidation of iron pyrites, which exist in coal, but more largely in one seam than another, but so far as my experience goes I have never seen a single gob fire in a seam that has contained any great amount of iron pyrites, either in this district or any other, but quite the reverse, as I have seen several large gob fires in seams that have been quite free from pyrites, comparatively speaking. The composition of coal itself (without the aid of iron pyrites) when finely divided is quite sufficient to cause spontaneous combustion in badly ventilated seams. The old idea as to spontaneous combustion is, in my opinion, a mistaken one, as I maintain that you cannot with any known appliances have too much air in a mine, and to illustrate this fact I may state that a few years ago I was in charge of a Thick coal pit which had just been opened. The temperature of the underground workings was moderately low, but as the workings extended the temperature rapidly increased, and the ventilation was altogether inadequate. According to the old system, I hung a lamp containing fire in the up-cast shaft, which for a short time slightly increased the ventilation, but as the side of work advanced, and more slack and more debris was stowed into it every day, the ventilation soon became worse than ever, and the temperature of the place soon rose to such a height that it was almost unbearable. I was convinced that the only remedy was a very considerable increase in the ventilating current circulating through the workings, and that we should soon have a gob fire unless steps were taken to prevent it, and as at that time I simply had charge of the underground workings under a mining engineer, I had to acquaint him with any alterations that were made or contemplated by me. I told him the state of affairs, and also of the slight improvement the lamp hung in the up-cast shaft had made, and suggested that a snatch, or furnace, should be built at the top of the up-cast to cause a greater amount of fresh air to circulate through the workings. He at once replied that I should not not have a snatch built, and blamed me for

putting the lamp down, as, so he said, it had caused a larger amount of air to circulate through the workings, which would undoubtedly set the pit on fire, but this gentleman, like many others, was labouring under a great mistake, for before one month had elapsed from the time I referred to the pit was on fire, and the only reason I could assign for it was not having a sufficient quantity of fresh air circulating through the workings to keep down the temperature. So it will be seen that one of the principal causes of spontaneous combustion is having an insufficient supply of fresh air in the underground working places, and the simple remedy for this is to increase the supply, as by this means the heat will be prevented from attaining the temperature of combustion.

Another cause of spontaneous combustion is the storing away of such large quantities of slack, or finely divided coals, which are usually left exposed to a moist atmosphere. The oxygen in this atmosphere is rapidly absorbed by the finely divided coals, and at the same time condensed; this condensation, as in all other cases, is attended with heat, and from such a mass of small coals the heat cannot escape as fast as it is generated, but rapidly accumulates, and spontaneous combustion follows. I, therefore, say that the seams of coal most liable to spontaneous combustion are those which contain a large proportion of oxygen, rather than those which contain a large proportion of iron pyrites or sulphur; and in order to prevent spontaneous combustion from this cause the smaller coal must not be allowed to accumulate, as accumulation confines heat, and, as before stated, the temperature should be kept down by constantly keeping a current of fresh air flowing through the workings. Underground fires may arise from several causes, either accidental or otherwise. The ventilating furnace is a source of danger when due care has not been taken in its construction, and the coal may be ignited by a spark from an underground boiler, or by a miner carelessly placing a lighted candle too near any highly combustible material, or it may arise from a blower of hydrogen gas, being ignited as it issues from the coal, which I am told actually occurred seven or eight years ago at one of the pits at the colliery now under my charge. It appeared that a shot had been fired during the night which had ignited a blower of gas, no attempt being made to extinguish it until the following morning; by this time, however, the fire had made great headway, and they struggled in vain for two or three days to extinguish it, but were compelled to abandon it at last for fear of an explosion, leaving eight horses in the workings, which were flooded for several months. Flooding the mine to extinguish an underground fire is not recommended except as a last resource, for raising the water again is a very slow and costly process, and the damage done to roadways is usually very great.

The best mode to extinguish an underground fire is to force carbonic acid gas into that part of the workings where the fire exists, the fire being shut off by building some good brick and sand stoppings, and pipes being built in with them to force the carbonic acid gas through. This gas can easily be prepared by the decomposition of limestone with hydrochloric acid. The old system of extinguishing gob fires was to cut off that part of the workings where the fire existed, but in most cases this is insufficient, for when the stoppings are removed the fire will often break out again in all its fury, and the same means have to be resorted to again and again, often ending in the best part of the coal being lost, for although the fire is enclosed, and the air excluded from it, the fire will still continue to burn, as the coal contains a great portion of oxygen, keeping the fire in a smouldering state, ready to break out afresh when the air is turned on to it.

Gentlemen, before closing my paper I will give a brief outline of the principal points to be attended to in ventilation, and at some future date I may be able to give you a paper on the principles of ventilation generally, and from what has been remarked respecting falls of roof, spontaneous combustion, &c., it will be seen that one effective preventive of such disasters is to keep a large volume of air constantly circulating through the workings, and to obtain this we must have either well constructed furnaces at the bottom of the up-cast shaft or a reliable ventilating fan with a considerable margin of power at the top of the shaft. Another important point in the ventilation of mines is the splitting of air into separate currents, and in doing so the following general rules should be observed:—

Every principal split of air should commence as near as possible to the bottom of the down-cast shaft, and should have a distinct airway to return in as near as possible to the bottom of the up-cast shaft. If the splits are commenced too far in the workings the total quantity is increased but very little, and when airways are nearly of the same area in all parts of the mine, and the workmen employed are equally distributed, the lengths of the different splits should be as nearly equal to each other as possible. If these points are well attended to they will have a tendency to render regulators, doors, bractings, and other obstacles comparatively needless. The benefits derived from splitting the air if judiciously carried out are very great—for instance, if we get 20,000 cubic feet of air per minute travelling in one current, and split the same with four distinct currents, we shall have 18,500 cubic feet of air in each current, or a total for the four splits of 74,240 cubic feet of air per minute, so that every time we split the air we get over nine-tenths of an increase to the total quantity in each split, but it must be borne in mind that splitting the air is limited by the area of the shafts. There is another important point in ventilation that should not be overlooked—that the airways should be made as large as possible; for instance, supposing that either by furnace or fan we get an overbalance of pressure of 10 lbs. per square foot, and this pressure sets in circulation 80,000 cubic feet of air per minute through an airway 100 ft. area, the same pressure will only set in motion a current of 20,000 cubic feet in an airway 50 ft. area, all other circumstances remaining the same, or, in other words, it takes four times the pressure to send a certain quantity of air through the 50 ft. area as it would to send the same quantity through the 100 ft. area. So instead of driving one gate-road and one air-head I strongly recommend the driving of two gate-roads, as the benefits derived from the same will far outweigh the cost.

A vote of thanks was passed to the author and reader, which was acknowledged.

PUMPING MACHINERY—No. III.

The CHAIRMAN said they had all listened to Mr. Husband's paper with the greatest delight, as he had spoken not only of the engines but the rods, and had given everybody ample room for discussion. He should like to know whether the rods would not be better and lighter if made with steel than with iron. With regard to the falling off in the duty of engines, he hoped that was a point upon which considerable stress would be laid in the discussion. It was certainly disappointing to find that in 1844 the average duty was 68,000,000, and that 30 years afterwards it was so much less. He had looked at Lean's Reporter for April, and found that the highest duty was only 68,000,000, and that was one of the pumping engines at West Seton. He was delighted to find that Mr. Husband had recommended surface condensers; he believed their adoption would be a great benefit to the county, and it was astonishing to him that they were not used. They were the invention of a Cornishman to remedy the ill effects of bad water on the boilers.

Mr. HUSBAND said, with regard to the use of steel in rods, they would get greater strength, but it had been found by experience that it was not so much to be depended upon. They would rather use soft iron where it was of a uniform quality. Steel broke up sooner than iron, but if steel could be so made that it could be adopted with security, it might save 20 per cent. waste.

Mr. LOAM cordially thanked Mr. Husband for taking this subject up; it was one of great importance to the county, and one on which great misconception existed. In the Gwennap mines, in which his (Mr. Loam's) father took a great part, he was old enough then to remember some of the experiments that were made. Before he referred particularly to Mr. Husband's paper, he would call attention to a paper which appeared in the West Briton of the previous week, in which there was a good deal of information, mixed with a good deal of fallacies and absurdities. The writer quoted Lord Derby speaking of the great consumption of coals when making a speech at Liverpool. He could understand that there was a great waste of coals in the North. A more wasteful system could not be adopted

than that in existence in the manufacturing districts, but when the writer applied Lord Derby's remarks to Cornwall he went quite wide of the mark. The writer estimated that the evaporation of water to 1 lb. of coal was 6 lbs., but the whole of the experiments tried in Cornwall for the last 40 years proved that they evaporated from 9 to 10 lbs. of water to 1 lb. of coal, and that at a pressure of from 30 to 40 lbs. to the inch. The writer then said he took the highest duty shown by Mr. Lean's Reporter, showing 10 lbs. to indicate the highest horse power, and the highest duty shown was 68,000,000, which gave 3½ lbs. for each horse power. But there was a vast difference between the indicative and effective horse power; they raised so much water, and delivered it at the adit at so much consumption of coals. He contended that their system was the only true one. They tested the quality of the coals in raising the water regardless of the friction. At the same time he felt that there was not sufficient attention paid to the causes of friction, which tended to reduce the duty of engines. At the time their engines did so high a rate of duty they had perpendicular shafts, the surveillance was perfect, the engines were new, every regard was paid to the quality of coal supplied, and to the training of the men who had charge of the engines. The falling off at present was due, he was afraid, to the absence of these things. The men were not so carefully trained, and their shafts, instead of being 100 fms. deep, had gone down 300 fms., and such an enormous length of rods, and the friction connected with them, must reduce the duty of the engine. He put up the West Seton engine in 1840, and it maintained its pre-eminence in working after 38 years' wear and tear. With regard to the question of economy, it was only to a comparatively small extent depending upon the engine. There were the boilers as well as the pit-work. It must be obvious to all of them that if they had not good boilers to evaporate water the duty of the engine must suffer. Then, of course, the quality of the coal varied. He heard a merchant at East Wheal Rose say that for 40 years the coal that was brought into this county had been deteriorating; they found sometimes that the best coal cost rather more than the beneficial results justified. At Dolcoath they tried the very best coal they could get, and upon a consumption of 4 tons they saved 10 cwt., but the price they paid for the extra quality left the mine in debt 1s. 6d., and the manager said he had to look to results. From an experience of 40 years he knew that the Cornish engine was what it ever had been—the best engine for the use of steam and for pumping purposes, and the falling off in duty was mainly due to preventable causes. They could not reduce their pitwork, and they could not always command trained men to use the coal, such as the county had a right to demand. These were matters beyond the control of the engineer, but he protested against it going out that the Cornish engines were deteriorating, and he added that the best specimens of the Cornish engines were not to be found in Cornwall, but out of the county, to a very large extent.

Mr. HUSBAND quite agreed that the men employed in stoking were not of the class they formerly were when they used to take particular care to have good men for stokers, and when they were allowed to have duty money. But with regard to the quality of coal, it was very important to determine how much water was evaporated by a certain amount of coal. He maintained that it was the duty of the managers of mines and engineers to determine the quality of the coal by the evaporation; that was the real standard by which they could arrive at an exact result. One great cause of the falling off in duty was that they worked the engines less expansively than formerly, but they could not work expansively unless everything was very strong and in good order. With steam 60 lbs. to the inch they would get as good duty as in former days.

Mr. LOAM thanked Mr. Husband for calling attention to expansion. Taylor's engines were expressly constructed for the highest possible expansion. The boilers were ½ thick, worked at 60 lbs., and the result was the highest obtained—upwards of 100,000,000. One engine was made too weak, and it broke down.

Capt. TEAGUE thought it was an error to work their engines expansively. With some of the best engines in the North they were pumping perhaps 50 or 60 fms., but most of the engines in Cornwall had something like a ¼ or ½ a mile of rods in connection with them, so that the effect of the high-pressure steam would be lost before it reached the end of their pitwork. He thought they were as capable of laying out pitwork now as at any former time, and that just as much attention was paid to it. It was only within the last fortnight that he had made a trial himself with one of their engines; they had been working at about 45 lbs. pressure on the boiler, and by reducing that to 25 or 30 lbs. they found that they could save something like six loads of coal a week; this was at the combined engine working at Carn Brea; it was, of course, a matter that required great ventilation. He might be misled by this fact, which he had observed; besides, their mines being now deep their water was not what it should be, and he believed that the surface condensers were the proper things to have, and that they would be a great benefit to them. He could see the force of working expansively in rotary engines, because the fly-wheel carried the engine round the point, but where they had got a dead weight to lift he failed to see the great benefit of it.

Mr. HUSBAND said the question of the expansion of steam for pumping-engines had been thoroughly agreed upon by all engineers, and could hardly be re-opened. The real fact was that engines could not be worked with great economy unless they were worked expansively; and instead of expansive working being particularly applicable to rotary engines, it had always been argued that their pumping-engines were particularly adapted to working expansively. There must have been something amiss with the engine at Carn Brea to get the result Capt. Teague had spoken of.

Mr. HUSBAND, in reply to Capt. Rich, said it had always been astonishing to him that surface condensers were not used in the county, because wherever they had bad water elsewhere surface condensers were ordered with the engines. As to the expense, it all depended upon the metal used—from 17 to 30s. per horse power.

Capt. RICH said they had a legacy left to them in crooked shafts, and where they had got these and a lot of flat-rods and angle bolts there was something to contend with. He thought they got now a fair quality coal, and the fault was not entirely with the stokers. He went down a shaft once and tried to dial it, and found it 16 fms. out of the way, and he was told that it was sunk by people who squinted. (Laughter.)—Capt. TEAGUE, jun., thought friction might be greatly reduced by the fixing of the rods.—Mr. W. H. RULE said in March, 1877, the duty of West Seton engine was 55,000,000, and in March, 1878, it was 68,000,000. He was thoroughly convinced that the great point was to watch the quality of the coal sent into the mines.—Capt. EVANS said that when the higher duty was obtained the engineers had all their own way. He was quite convinced that the present engineers had very little power in their hands. There was a time when in Cornwall they worked at a higher pressure than in any other part of the world, but they had allowed other people to advance with high pressure while they had gone down the hill. His own opinion was that they should commence to work steam at least from 60 to 80 lbs. to the inch, and they must build their boilers to stand high pressure. What on earth should keep them from red-hot steam, and what did they work with steam at a pressure of from 17 to 35 lbs. to the inch? It appeared to him a very foolish thing. In a factory a man could not do his work if the steam was not up to 60 or 70 lbs. It was impossible to get high duty with steam at 35 lbs. to the inch. They should let the engineers carry out their own principles, and hold them responsible. Then, again, for high-pressure work they would have to build better houses for their engines. There was hardly an engine-house now in the county that would stand an engine working at 60 lbs. to the inch.

Capt. RICH said it was foolish to put an elephant to work in the harness of a donkey; if they worked their engines expansive, away would go their pitwork.—Mr. HUSBAND said it would be easy to increase the strength of their present boilers 50 per cent. by means well known to engineers; it did not follow that if they had high steam it was going into the cylinder to do injury.

Capt. RICH thought it would be an improvement to have hollow rods.—Mr. HUSBAND: You might have hollow rods, and pump the water through them.—The CHAIRMAN said surface condensers would save them the continual bother of reporting them for doing less duty from encrusting, and from the danger of explosion to which they were at present exposed. Although surface condensers might

be expensive, he believed they would be found to be the cheapest thing in the long run; and if the result of that discussion should be the introduction of surface condensers into some of our mines, he thought the Mining Institute would not have lived in vain. (Applause.) They had heard of the different causes which led to a reduction of duty, but it was a fact that the engine that was doing the highest duty in the county was doing that duty in a crooked shaft. There was not so much interest taken in this question of duty as there was formerly, and he believed if more engines were reported, and if they had at the same time the indicated horse power as well, and if premiums were given to the stokers, considerable advantage might be derived.

Capt. Cox moved a vote of thanks to Mr. Husband for his very able paper.—Mr. LOAM seconded it, and said a more important paper to the county or to the kingdom at large it had not been his good fortune to listen to at any meeting of that Institute.

The CHAIRMAN hoped that the state of their funds would be such as to enable them to print the paper at an early date.

A vote of thanks to the Chairman brought the meeting to a close, which is the last of this session.

— West Briton.

THE PARIS INTERNATIONAL EXHIBITION.

No. VIII.

[FROM OUR OWN CORRESPONDENTS.]

We have now to draw the attention of our readers to the New South Wales Court, which concludes the exhibits furnished by the colonies of Australia, and we think that the representative objects presented to view in that section will give a fair idea of the importance to which the colony has attained. It appears that it was only at the last moment, so to speak, that the authorities in Sydney decided to exhibit. Considering this, and the long distance of the colony from the point of exhibition, it is surprising we have so large and beautiful a collection of mineral and other objects exhibited. Undoubtedly great credit is due to those gentlemen who have devoted considerable time and shown much skill in the general arrangement of this court, and of the articles contained therein. We have pleasure in stating that we have received great courtesy from M. Jules Joubert, secretary to the Representative Commissioners at Paris, who has shown great willingness to assist us whenever we had occasion to refer to him. Exhibits in this court are both numerous and important; we shall, therefore, have some difficulty in crowding into two notices even a very brief description of the articles under consideration, and we fear we may not be able to do justice to the colony and its exhibits in so limited a space as two articles will allow. We hope we shall soon be able to go over the Canadian and Cape of Good Hope courts, the exhibits of which are of great interest, as representing two colonies very rich in minerals. We then propose to enter upon the British minerals, and afterwards those exhibited from foreign countries, and, finally, we hope to give a particular description of the machinery exhibited as applied to mining and other manufactures. At present we are under the impression that foreign countries have far outstripped England in the exhibition of mineral and geological specimens.

The New South Wales Court is divided into 25 classes, numbered, with some breaks, from 1 to 75 inclusive. Under class 1 we have oil paintings; class 2, drawings of every kind; class 4, architectural drawings; class 5, engravings; class 9, printing and book-binding; class 12, photographs; class 16, geological maps; class 33, woolen fabrics; class 39, jewellery and precious stones, all of which are included in the first group—works of art. Class 43 refers to mining and metallurgy, raw and manufactured products. Class 44 includes products of the cultivation of forests, &c. Class 45 refers to Natural History. Class 46 includes agricultural products not used for food; class 47, chemical products; class 49, leather, skins, &c.; class 61 refers to processes used in various works; class 63 to harness and saddlery; class 64, railway apparatus; class 69, alimentary and other products; class 70, fodder and military campaigns; 71, 72, and 73 refers to milk, meat, vegetables, and fruits; class 74 includes condiments and stimulants, sugar and confectionary; and class 75 refers to fermented drinks, wines, &c.

The Rev. M. B. Clarke, Examiner of Coal Fields for the Government of New South Wales, recently examined the western district of the colony, and he has arrived at the conclusion that there are many miles of country in which the rocks which belonged to a golden age yet remain in their original condition, and will so remain until some fortunate adventurer stumbles by accident on a tangible encouragement. It seems, with some few exceptions, that quartz veins have not been worked to any great depth, and these only in a few localities, and that the auriferous resources of the colony have scarcely been touched. Alluvial lands have, in some instances, been worked to a depth of 200 ft., and it has been asserted upon good authority that there are the strongest indications of deep leads in various parts where no attempt has been made to work them. There is still, therefore, great scope for the remunerative employment of a large population in both alluvial and quartz mining upon the immense tracts of country which are well known to be auriferous. The weight of gold obtained in this colony to the end of 1877 was 8,725,119.68 ozs., of the value of 32,486,332. Ozs. 7d. In this court there are 33 samples of gold from the northern, southern, and western gold fields, also rich specimens of auriferous quartz from the Star of Peace and other mines, and also a model representing the total production of gold in New South Wales, to which we have before referred. It has been ascertained that the approximate area within the proclaimed gold fields is 35,500 square miles, but the geological formation of the country is so promising that it leads to the opinion that the area in which payable gold deposits will be found will far exceed that stated. From the returns of the alluvial mines we find that the average yield from the wash-dirt was 1 dwt. 23.14 grs. of gold per ton. The average yield of quartz mines by crushing gave 13 dwts. 8.20 grs. per ton. Some particular reefs, however, yield at a far higher rate, such as those at Hill End, where from 30 ozs. to 2100 ozs. of gold per ton has been obtained, but whether such reefs yielded similar results constantly we are unable to state, although the processes for extracting gold are now far superior to what they were, still much gold is lost in the tailings consequent upon the imperfect appliances employed.

The department of mines, Sydney, exhibits a collection of auriferous specimens of New South Wales, arranged by C. S. Wilkinson, L.S., F.G.S., Government Geological Surveyor. These are numbered from 300 to 370 inclusive. They consist of auriferous quartz from different mines; that numbered 304 is from the Annet's Mine, Adelong, which is 700 ft. in depth, and yields at the rate of 6 ozs. of gold per ton. No. 308 is from Lady Belmore Reef, near Braidwood; this mine yielded 12 ozs. of gold per ton. Nos. 339 and 340 are specimens of auriferous quartz from the Great Victoria Mine, Adelong, 800 ft. level. No. 342 is a specimen from Fletcher's Reef, Victoria Extended, mine 240 ft. deep; vein, 1 ft. thick, yielding 2½ ozs. per ton. No. 345 is from Old Reef Mine, Adelong, obtained at a depth of 28 ft.; the vein is 1 ft. thick, and the yield is at the rate of 2 ozs. per ton. No. 346, auriferous quartz, North William's claim, at Adelong, 240 ft. deep; the yield of gold from this mine is 4 ozs. per ton. No. 354 auriferous quartz from Victoria Extended, Adelong, 250 ft. in depth; the vein is 2 ft. in thickness, and the yield 3 ozs. per ton. No. 358 is a specimen of quartz, Lac-ma-lac, near Lumut; the yield from this mine is 18 ozs. per ton. No. 359 is a specimen of micaceous granite containing gold. Araluen Mine; the yield is about 2 dwts. per ton. All the other specimens are similar. The New South Wales Commissioners exhibit samples of gold, and also auriferous quartz from Hill End and Gulgong. On the Gulgong gold field over 16 tons of gold were obtained, chiefly from alluvial deposits, in the space of seven years. Specimen No. 6 is auriferous quartz from Adelong. On this gold field the Great Victoria gold mine is 820 ft. deep. The quartz reef occurs in hornblende granite. The gold mine at Hawkin's Hill, before referred to as being so rich as to produce from 30 to 2100 ozs. of gold per ton, does not appear to be worked so economic as it might be, the saving appliances being defective. Some difficulty, however, presents itself in the form of the presence of pyrites, and other associated minerals. Some of the waste tailings have been sent to England, and have been proved to contain a con-

siderable amount of gold. These are matters to be considered and wisely dealt with by all those who may be connected in forming companies for working gold mines in the Australian colonies.

The following statistics refer to the samples of New South Wales gold assayed at the Royal Mint, Sydney, and exhibited by the New South Wales commissioners:—

ASSAY REPORT.

Locality.	Gross weight.	Loss per cent. in melting.	Weight assayed.	Gold in 10,000 parts.	Silver in 1000 parts.	Standard gold.	Fine silver.	Value per oz. after melting.
Tamworth	2.00	3.12	1.93	9180	80	1.923	.15	3 18 1
Armidale	2.00	4.24	1.92	9180	77	1.918	.15	3 18 1
Gulgong	2.00	3.19	1.94	9465	242	1.968	.47	3 18 1
Adelong	2.00	2.21	1.96	8895	103	1.903	.20	3 18 0
Stroud	2.00	2.51	1.95	9455	43	2.018	.08	3 18 0
Grafton	2.00	2.82	1.94	9000	15	1.905	.18	3 18 0
Stroud	2.00	1.83	1.93	8500	143	1.817	.28	3 18 0
Tenterfield	2.00	2.00	1.96	8865	106	1.895	.21	3 18 0
Sofala	2.00	2.40	1.95	9435	52	2.007	.10	4 0 5
.....	2.00	1.37	1.97	9220	70	1.911	.14	3 18 7
Bathurst	2.00	1.92	1.96	9300	67	1.988	.13	3 18 3
Hargraves	2.00	1.38	1.97	9480	45	2.037	.09	4 0 8
Hill End	2.00	.97	1.98	9480	48	2.048	.09	4 0 8
.....	2.00	2.43	1.95	9405	54	2.001	.10	4 0 3
.....	2.00	3.00	1.94	9430	46	1.996	.09	4 0 3
.....	2.00	1.84	1.96	9445	61	2.019	.10	4 0 5
Mudgee	3.00	1.55	2.95	9.75	63	2.935	.20	3 19 1
.....	2.00	8.86	1.82	9185	73	1.823	.13	3 18 3
Gulgong	2.00	1.26	1.98	9335	60	2.016	.12	3 19 6
Young	2.00	1.11	1.98	9480	48	2.048	.09	4 0 9
Kiandra	2.00	3.07	1.94	9265	69	1.961	.13	3 19 0
Braidwood	2.00	1.96	1.96	9575	38	2.047	.07	4 1 5
Araluen	2.00	1.34	1.97	9240	69	1.968	.14	3 18 9
Adelong	2.00	1.44	1.97	9550	99	1.923	.19	3 18 5
.....	2.00	1.29	1.98	9430	52	2.037	.10	4 0 4
Bathurst	2.00	1.12	1.98	9545	43	2.052	.08	4 1 3
.....	2.00	1.74	1.97	9280	59	2.018	.12	3 19 11
Orange	2.00	3.00	1.94	9520	41	2.015	.08	4 1 1
.....	2.00	2.13	1.98	9285	63	1.985	.13	3 19 1
.....	2.00	3.93	1.92	8305	151	1.739	.29	3 11 2
Stony Creek	2.00	2.19	1.98	9425	50	2.015	.10	4 0 3
Parkes	2.00	2.48	1.95	8990	96	1.910	.19	3 16 8
.....	3.00	1.54	2.97	9250	68	2.997	.13	3 18 9
	68.00		66.44			66.611	4.84	

Samples of antimony ore from various localities and ½ ton of star antimony of fine quality are exhibited; the value of the antimony raised in 1877 amounts to 7168*l*. It is the opinion of those best qualified to judge that antimony mining will become of considerable importance. Not much attention, however, has been given to the development of the lodes containing this ore. The value of silver raised during 1877 was 6673*l*, and the total production up to that date amounted to 112,139*l*. Galena (sulphuret of lead) is of common occurrence throughout the mining district of New South Wales, but from some cause or another which does not appear the lodes hitherto discovered have not been profitably worked. The Department of Mines, Sydney, exhibits a collection of antimony, lead, and silver ores from New South Wales. They are numbered from 245 to 278, and consist of sulphuret of antimony, galena, cerussite, carbonate of lead, silver ore, cinnabar, sulphuret of mercury, sulphuret of antimony, arseniate of lead, mispickel, arsenical pyrites, &c. Exhibit number 277 is one of arsenical pyrites and galena, obtained from Strickland's Reef, near Forbes, and by assay it yielded 1 oz. 10 dwts. of gold and 1 oz. 19 dwts. of silver per ton. The former specimens were all taken from different mines. The commissioners also exhibit 21 ingots of star antimony, weighing 1016 lbs. Next to gold the tin ore ranks in importance as a source of wealth to the colony; the area of the tin fields of New South Wales has been estimated at 8500 square miles, and according to the official report of Harrie Wood, Esq., under secretary for mines, the value of the total production of tin to the end of 1877 amounts to 2,375,950*l*. During the year 1876 there were engaged in raising ore no less a number than 1653 persons, the earnings of each being estimated at 152*l*. 15*s*. 9*d*. This is considered to be greater than the average earnings of gold miners. The tin ore is at present chiefly obtained from alluvial deposits, but as several lodes have been discovered, doubtless the annual production of tin will be much augmented. It has been known that tin ore existed for some years past, but no particular attempt was made to mine for it until 1871. Tin ore has been discovered in several portions of the colony, but the most extensive deposits are found in its northern portion. During the year 1872 the tin ore raised was valued at 47,703*l*, in 1873 at 334,436*l*, and 1877 at 508,540*l*; the total, as we have said before, up to that date amounting to 2,375,950*l*. The ore is worked on the plan known in Cornwall in ancient times as stream tinning—i.e., in the beds of water courses, &c.—and it is separated from the soil by sluicing. The alluvial deposit of tin is not only found in existing water-courses, but also in those of ancient date, at a depth of 60 to 80 ft. below the surface; but commonly the deposits are only covered with a few feet of soil. Valuable lodes and reefs containing tin have also been discovered, and in some places crushing machinery has been used to extract the ore. The other Australian fields also produce a large additional supply of tin. The profit of tin mining in this colony has somewhat suffered in consequence.

The tin-bearing granites of New South Wales belong to the same geological era as those of Derwent and Cornwall; and no doubt, the same as in the latter places, it will take many years from the time of stream tinning to that at which the reefs will become too deep for profitable working. It has been reported to the New South Wales Government that many years will elapse before the ground now being worked will be exhausted, and that the tin fields open a wide scope for the employment of the labouring classes. The tin exhibits are very numerous, and show all the different forms in which this mineral has been found in the colony. The Department of Mines, Sydney, has furnished a collection of tin ores numbering from 1 to 99. These are obtained from the different mines at work in the colony. They consist of lode tin, stanniferous cement, surface cement, stream tin, stanniferous wash dirt, black sand, toad's-eye tin, grain tin, crystalline, sulphide tin, &c. There is likewise another collection of samples of tin ore taken from the New England district. They are numbered from 1 to 76 inclusive. The specimen No. 70 is from Cope's Creek, obtained from a very rich claim, the tin being contained in a thickness of 6 ft. of wash dirt. The New South Wales Commissioners also exhibit some specimens of tin, one being from a lode in eutritic granite at the Bolitho Tin Mine. There is also an exhibit of 55 bags of lumps of tin ore, which have been found on the dividing range at the Gulf, northern portion of New England, weighing about 30 cwt. Also 18 glass jars, containing samples of tin ores and wash from various districts. The ore labelled "Deep Sinkers" is from a property of about 300 acres in extent, situate at about the highest point of the dividing range of the colony, at the Gulf in the New England district. The ore of this description is formed in irregular lodes or patches at from 1 to 6 ft. from the surface. On this same property there is a lode in granite casing only partially opened. It exhibits from 3 to 7 in. of ore, and from assaying tests would yield 72 per cent. of pure tin. Alluvial ore also exists at depths varying from 10 to 20 ft. from the surface, in a gravel wash of from 1 to 3 ft. in thickness. The specimens of ore labelled "the Butchart" are from a property about 200 acres in extent, and is situate on the mountain ranges near Cope's Creek, in the district of New England. There is a reef opened up on this property, averaging about 6 in. in thickness, and is worked by a perpendicular shaft 30 ft. The lode gradually widens to about 8 in. at the bottom, and the yield is about 75 per cent. of pure tin. The glass jars referred to, and numbered from 1 to 18, contain specimens from the several tin-bearing districts of New South Wales. Messrs. A. and R. Amos, Pyromont Tin Smelting Works, Sydney, exhibit 600 large ingots of refined metallic tin, in the usual form of Australian tin, and 620 ingots of fine metallic tin, in special size for retail trade, weighing 25 tons, also 400 ingots to show purity and quality; grain tin, tin sticks weighing 4 cwt. 2 qrs. 3 lbs.

Under the heading Mining and Metallurgy, class 43, the Department of Mines, Sydney, exhibit a collection of the chief character-

istic fossils from the Lower Palaeozoic—Silurian. These are numbered from 1A to 53, and consist of coralline limestone, favosites, encrinurals, limestone, crinoid, orthoceras, tentaculites, trilobites, euomphalus, receptaculites, syringopora, cyathophyllum, &c. From the Middle Palaeozoic—Devonian—there are a series of exhibits numbered from 36 to 53 inclusive, and consist of lepidodendron nothum, spirifer limestone breccia, containing corals, encrinurals, &c. From the Upper Palaeozoic—Carboniferous—there are specimens numbered from 54 to 74 inclusive, consisting mainly of lepidodendron and otopteris ovata, knorria, euomphalus, corals, &c.; spirifer, strophomena, rhynchonella, &c.; productus, &c.; plant stems, fenestella. From the Lower Coal Measures—lower marine beds—the exhibits are numbered from 75 to 100 inclusive, and consist chiefly of fossils similar to those already described. From the upper marine beds there are a series of exhibits numbered from 101 to 139 inclusive, and are also similar in character for the most part of those described. From the upper coal measures the exhibits are numbered from 140 to 175, and include phyllothea, glossopteris, vertebrae, echniostrobus, conifer stem, &c.; vertebrae, Australia, phenopteria, &c. From the Lower Mesozoic—Triassic—there are a series of exhibits numbered from 177 to 184 inclusive. From the Cretaceous—Miocene—there are exhibits numbered from 185 to 203, consisting chiefly of miocene tertiary plants. The exhibits from the Cretaceous—Pliocene—are numbered from 204 to 225 inclusive, and consist chiefly of Tertiary cement, with leaves, pliocene Tertiary plants, fossilised wood, spondylostrombus Smythii, penteneus Clarkii, phymatocaryon bivalve, &c. From the Cretaceous—Pleistocene, and Recent—there are a collection of fossils numbered from 226 to 245 inclusive, consisting of upper jaw of sthenurus, portion of zygomatic arch of diprotodum, ribs of diprotodum, tips of lower incisors of the diprotodum, cap of pelvis bone of diprotodum, molars of diprotodum, lower jaws of new species of wombat, large toe-bone of gigantic kangaroo, portion of femur of diprotodum Australis, fragment of shaft of femur of diprotodum, left ramus of lower jaw of bettongia, upper, lower canine teeth of sarcophilus ursinus, aboriginal tomahawks, &c.; also bones encrusted with stalagmite.

No special search has hitherto been made in any portion of New South Wales for gem-stones, many, however, have been discovered by gold miners. The Commissioners exhibit a beautiful collection of stones, numbered from 1 to 26. They consist of Oriental topaz, sapphires, rubies, blue sapphires, moonstone. Three Oriental topazes, blue topaz, 11 ozs. 5 dwts. troy weight; cats-eye, amethyst, zircon, olivine, diamonds, two spinel rubies, basklyite, four opals, rough opal, cairngorms, white topazes, emeralds, &c. There are also some other precious stones exhibited by private individuals. The Department of Mines also exhibit a series of maps, consisting of geological maps of the districts of Heartclay, Bowenfels, Wallerawang, and Rydal. Map of gold-bearing country in the vicinity of Tamarooora, Hill End, the Turon, and Chamber Creek, showing the townships, gold leases, improvement purchases, features, &c., comprised in about 42 square miles, extending from the Dirt Holes Creek on the north, in the strip of country 3 miles wide and 14 long, to Chamber Creek on the south. The scale of this map is eight chains to an inch. Map of gold-bearing country in the vicinity of the town of Parks, showing the townships, gold leases, improvements, and conditional purchases, features, &c., comprising about 18 square miles. Map of gold-bearing country in the vicinity of the town of Forbes, and showing the same particulars as the last preceding one, and comprising about 17 square miles. All these maps are drawn to the same scale. Diagrams showing in natural size the thickness of the principal seams of coal worked in the coal fields of New South Wales.

Seven diagrams showing the character, thickness, and portion mined out of the seams of coal worked at the different collieries in New South Wales, by Mr. John Mackenzie, F.G.S., Government Examiner of the Gold Fields. Maps showing the agricultural areas of New South Wales, and map showing the mineral areas of New South Wales. The jurors have commenced their labours, which, as may be supposed, are very great, and it requires considerable judgement, discernment, and practical experience to be brought to bear in determining the many awards which of necessity it will be necessary to make. It is believed that the end of the present month is the earliest time at which their duties will be completed. Unless matters advance more rapidly than they have hitherto done many of the exhibits will not be in a fit state to be properly examined.

The pavilion on the Quay d'Orsay contains the exhibits of the French ports, and it has now been opened to the public, but there are several others remaining to be completed before the public can be admitted to them. The sheds on the Quai de Billy contain rolling stock and appliances to second-class railways, traction cars, &c. We shall refer more particularly to these things on a future occasion. The Creusot Pavilion is of great interest, containing, as it does, a large collection of minerals, models, and machinery employed by that company. In the American section a small horizontal engine has been received, and there are many other similar things yet to be delivered. Bills of lading of such goods were delivered to the Exhibition as recent as the 24th ult., and we have been informed there are many cases of the kind, and that many interesting machines will be added to several of the sections. Only those who remain to the end of the Exhibition will be favoured to see its progressive development and full bloom, so to speak. It bids fair to be a complete success, as may be estimated when we state that on grand days and Sundays the number of visitors have reached 200,000. On ordinary days the average number has been about 70,000.

There is a report abroad that the time for closing the Exhibition will be extended to the end of October. Such an arrangement would, no doubt, be a great boon to intended visitors, as the temperature at that time of the year would allow more time being devoted to the Exhibition than at present. Doubtless also some commercial advantage would accrue to exhibitors, but whether it would extend itself to any but the French is not so clear. We are decidedly of an opinion that both visitors and exhibitors would receive benefit. The Exhibition is such a gigantic concern, and the articles are so varied and important, that it is next to impossible for visitors to derive much benefit by a short visit to Paris. Those who think they can know all about it in a couple of months are much deceived. An excellent arrangement has been made by which the French soldiers are allowed to visit the Exhibition. This is according to a decision of the Minister of War, and 200 soldiers daily are being admitted, and have free access to the whole of the Exhibition, arriving at the entrances of the Trocadero and Champ de Mars at eleven o'clock in the morning, and meeting in front of the Ecole Militaire at half-past four.

On Sunday last occurred one of the grandest fetes ever witnessed in Paris. The illuminations were general over the entire city, and at certain points extensive fireworks were displayed. The avenue de Bois de Boulogne commences nearly at the Arc de Triomphe, the Bois itself commences at the gates outside the fortifications, and consists of a series of large avenues and woodlands, varied by a string of lakes. To describe the scene that took place by mere words is simply impossible; every tree near the avenues was lighted by many small coloured balloons or lamps. At stated intervals along each avenue ornamental poles were erected, these being laden with a vast number of small coloured glass lamps, wrought into all sorts of curious, but pleasing, figures. But the grandest scenes of all were to be found on the islands formed by the lakes. At such points the illuminations were so many and so magnificent that in the night it could only be compared to fantastic scenes often said to exist in Fairy Land. The fireworks at these points were numerous, which with the Bengal and other coloured lights flashing through the trees and sky at many points at the same time, certainly presented a scene dreadfully grand. The statue of the Republic was formally unveiled in the Champ de Mars on Sunday, and was one of the first acts which ushered in the grand fete. Nearly all the ministers of the French Republic were present. Orations were delivered by them. The statue of Liberty, by M. Bartholdi, which is destined for New York, and which until now had been under cover in the park, near the entrance to the temporary Exhibition buildings, was also uncovered, and visited by the ministers and others engaged in the inauguration of the statue of the Republic. The American National Anthem was played.

Meetings of Public Companies.

COLONIAL BANK.

The eighty-first half-yearly general meeting of proprietors was held at the Bank House, Bishopsgate-street, on Thursday, Mr. T. D. HILL in the chair.

Mr. JAMES CLARK (the secretary) read the notice convening the meeting, and the subjoined report of the directors was then submitted.

The directors had much pleasure in presenting to the proprietors the statement of accounts for the half-year:—

DEBITS.				
Circulation...	£	410,798	9	2
Deposits, bills payable, and other liabilities...	2,558,177	11	0	0
Paid up capital...	600,000	0	0	0
Reserve fund...	85,000	0	0	0
Balance of profit from last half-year...	2216	13	2	
Net profit for the half-year...	46,244	19	9	
Total...	£4,005,437	13	8	
ASSETS.				
Specie...	£	308,958	18	9
Due to the bank in the colonies on bills discounted and purchased (including those past due), &c. ...	1,491,465	18	2	
Due to the bank in the colonies on current accounts...	21,107	17	2	
Due to the bank in London on bills remitted, cash at bankers, &c. ...	2,175,629	18	8	
Bank premises and furniture in London and in the colonies ...	8,265	2	11	
Total...	£4,005,437	13	8	

The period of three years having elapsed since last gratuity was presented to the officers and clerks the directors have awarded a gratuity of 10 per cent. on their salaries, which they do not doubt will meet with the approval of the proprietors. The directors having made provision for all bad and doubtful debts, now recommend that out of the net profit shown in the above statement of £4,244 19s. 9d., after deduction of the £4,005 13s. 8d. which amounts to 3347 4s. 11d., leaves £239 15s. 9d., and adding amount brought forward 2168 13s. 2d., together £2408 15s. 11d., an ordinary dividend of 1 per cent., and an extraordinary dividend of 1 per cent., be made on the paid up capital of the corporation for the half-year ending Dec. 31 last, which requires £42,000; and that out of the remaining £1144 8s. 11d. the directors recommend that the sum of £2000, be carried to reserve fund, increasing that fund to £90,000, and the balance of £1144 8s. 11d. carried forward to next half-year.

The directors have pleasure in being able to maintain the same rate of dividend as in the two previous half-yearly periods. The sugar market, however, during the last six months shows a considerable decline compared with the corresponding period of last year, and although the crops of our West Indian colonies appear generally satisfactory. The directors regret that nothing has been done to remedy the evils to legitimate enterprise occasioned by the continental bounty system, although the subject has been continually pressed on the attention of her Majesty's Government.

The CHAIRMAN had much pleasure in moving the adoption of the report; for, considering the great depression that had prevailed in trade generally, he felt sure they would receive it with satisfaction. They had often heard from that chair that banking in the West Indies could not be carried on without losses, but he might congratulate them that during the last six months their losses had been very light. This was to a considerable extent due to the energy and judgment of their staff—a fact which would add to the pleasure which he was sure the proprietors would feel in passing the gratuities referred to in the report. He was not aware that he had any further observation to make, but he could not sit down without referring to the question of the bounty-made sugar, which had been so often mentioned. There was a great increase year by year in the quantity of this kind of sugar brought into the English market, until it had now reached the enormous quantity of 300,000 tons per annum. It is quite a mistake to suppose the foreigners make us a present of the bounty; it cheapens all sugar, and he estimated that the loss to the West India planters was not less than 200,000l. a year. Now, however, statesmen and political economists were beginning to agree that this bounty system is averse to the principle of free trade; he trusted, therefore, the time was not far distant when some remedy would be found. He concluded by formally moving that the report of the directors be received and adopted. Mr. HENRIQUES seconded the motion, and it was unanimously agreed to.

The CHAIRMAN said he had now only to move that a dividend of 6 per cent. and a bonus of 1 per cent. be declared, and that such dividend be declared payable after the 10th inst.—Mr. HENRIQUES seconded the motion, and it was unanimously agreed to.

Mr. BENTLEY, in moving a vote of thanks to the Chairman and directors, remarked he had long been a large shareholder, and was glad to see that their profit appeared to be rising a little, and was well satisfied that all their staff should have the gratuity that had been voted.

A PROPRIETOR seconded the motion, and suggested that the next time there was any falling off in profits the difference should be made up out of the reserve fund; this he considered a proper purpose for the reserve fund to be applied to.

Another PROPRIETOR was quite as fond of the 7½ per cent. as the gentleman who had just sat down could be, but they must not lose sight of the fact that the dividend had not been reduced; it was only the bonus which had fallen off, and there might be some little inconsistency in using a reserve to increase a bonus.

Mr. BENTLEY then put the vote of thanks to the meeting, and it was carried with acclamation, and the CHAIRMAN having acknowledged the compliment on behalf of himself and his colleagues, the proceedings terminated.

CWM DWYFOR MINING COMPANY.

An extraordinary general meeting of shareholders was held on Wednesday at the offices of the company,

Mr. TURNBULL in the chair.

The CHAIRMAN having declared the meeting duly constituted, the secretary read the notice convening the meeting.

The CHAIRMAN said that at the last meeting it was proposed to issue 5000 12½ per cent. first preference shares for the purchase of the Brynarian property, but as that amount was not required at once it was thought better that each shareholder be asked to take 10 shares, which would be finding 10l. each, in order to make a trial of the mine. The majority of the shareholders had agreed to this proposal, but unless all would come forward and find the small sum asked for in order to make up the amount required there was no alternative but to wind-up the undertaking, and so make a dead loss to all concerned. Both he and the directors were very loth to take this final step, as they still believed Cwm Dwyfor was a good mine, and this meeting had, therefore, been called. With regard to the new property, it was thought that if 600l. had been subscribed operations could have been carried on at two points, but it was now proposed, if another 10l., in addition to what had been already promised, could be raised, to confine operations to one point—sinking Morgan's shaft 8 fms. deeper down to the 20 fms. level. It would be seen that the conditions on which the company were to go to work at the Brynarian Mine were most favourable. At first the proposal was that there should be a small payment to the vendor, the advantage of proving the property without making any present payment to the vendor. Morgan's shaft could be sunk to the required depth, including the purchase of a rope, &c., for about 1200l., and the other capital would be expended in driving levels east and west from the bottom of that shaft. All the reports and accounts of the mine were very favourable, and both the secretary and Capt. Jewell had been over the property two or three times. Capt. Jewell was present and would tell the meeting what he had seen when visiting the mine.

Capt. JEWELL said, on his third visit he had the water drawn out of Morgan's shaft for 4 fms., and found the level going down in the shaft, and he himself broke the lode to be 70 l tons or 1½ ton per fathom, and Capt. Ridge, the former captain of the mine, who had sunk Morgan's shaft, said the lode was standing right down to the bottom of the shaft, and that probably 6 or 7 tons of lead ore machinery, and could easily be divided into three parts, and if the trial proposed to be made by the company was successful each of the three parts of the sett would be cheap to sell at 2000l. He then referred to a letter from O. Morgan, a taken sufficient blende would be met with there to pay the cost of driving that level, so as to come under Morgan's shaft. Capt. Jewell then explained the position of the Cwm Dwyfor Mine, and stated that there were at the present time two (south) westward into the hill; it was also probable that the run of lead met with further west.

Major-General COLE said that he had no knowledge of mining, and in common with the other shareholders, he was greatly disappointed at the result of his operations hitherto at the Cwm Dwyfor Mine; but it did seem that the supposed gave the undertaking another chance, and he could not out to the small sum asked for, especially as there appeared to be security for the shares.

The SECRETARY stated, in answer to General Cole, that it was not intended to abandon Cwm Dwyfor Mine, but to work the Brynarian property, and if it proved successful to sell one or two portions of that property, and with the proceeds, if

the shareholders approved of it, to complete the laying open of the Cwm Dwyfor Mine.

The CHAIRMAN said he thought with so few shareholders present it would not be wise to pass a resolution to wind-up the undertaking, and proposed that the meeting should be adjourned till Thursday the 25th inst., meanwhile the secretary would send a circular to all the shareholders, begging them to find the small balance required to enable them to commence working the Brynarian property, and, as he believed, to bring the undertaking to a successful issue.

The SECRETARY explained that subscribers for the preference shares now offered might regard them as secured, as they formed a first charge on the machinery at Cwm Dwyfor, which cost over 800l.—The meeting then separated.

TREBEIGH CONSOLS MINING COMPANY.

At the general and special meetings convened at the office of the company on Wednesday, for the purpose of making a call and to confirm certain resolutions passed at the meeting held on June 12

—Mr. W. S. TANKARD in the chair—prior to the reading of the notice by the Secretary, there was some discussion as to whether, a general meeting having been held but three weeks since, another general meeting being called now was in accordance with the provisions of the Stannaries Act, and if so, whether the ordinary business that could annually be transacted at a general meeting could not also be brought before this. It was believed to be in good form, and the SECRETARY proceeded to read the notice, with the minutes of the last general meeting. On the question of call being submitted to the meeting there were strong remarks on the heavy amount now due, and which, it appears, is principally owing by one or two shareholders and their friends, and has been accumulating some considerable time. It was ultimately decided to make a call of 1s. per share, and to call special meeting for the purpose of declaring absolutely forfeited all shares upon which any call or calls shall then remain unpaid. A hope was expressed that some arrangement might be come to prior to the meeting so that the finances of the company might be placed on a more satisfactory basis. It was stated that one or two of the merchants were pressing for payment of their claims, but doubtless an interview may be effectual in restoring confidence in the solvency of the concern.

The resolution passed at the general meeting ordering the affairs of the company to be wound up was not confirmed inasmuch as it was considered imperative, no notice having been given to the shareholders, that such resolution would be submitted to them, and further that the prospects of the mine did not justify the abandonment of the same. A special report was read, which had been obtained by a gentleman present, in which it stated the sinking of the shaft another 15 fms., and as Capt. Gifford, who was present, corroborated the views of the inspector, and gave it as his opinion that it would be a pity to stop the mine when the prospects were so encouraging, some discussion followed as to the propriety of letting the water into the mine, which could be pumped out in a week or so, but as this rests with the representative of the lessors it would be impracticable without his consent.—A vote of thanks to the Chairman terminated the proceedings.

SNOWBROOK SILVER-LEAD MINING COMPANY.

The second ordinary general meeting of shareholders was held at the offices of the company, 84, King William-street, City, on Friday, Mr. F. E. BINGLEY in the chair.

The directors' report, which was taken as read, congratulated the shareholders on the satisfactory results yielded by the mine, and particularly on the fact that the ore now at surface, and the prospects of the mine generally, fully warrant the purchase and erection of crushing and dressing machinery. For this purpose about 2000l. will be required, which it is proposed to raise by debentures.

The report of Capt. Owen, the manager, also urges the immediate erection of the required machinery, and states that from the ore now at surface, and from the excellent prospects in the present workings, profitable and regular returns may be confidently expected.

The SECRETARY having read the notice convening the meeting,

The CHAIRMAN said he would not trouble them with many remarks, as he had not much to add to the reports which they had seen, and which had been forwarded to all the shareholders. But before he proposed the resolution which it would be his duty to submit for their approval, he thought he might venture to congratulate them on the present excellent prospects of the Snowbrook Mine. The canter lode, which alone was being worked, at present continued to yield a satisfactory quantity of lead ore, and showed every indication of continuing to do so. It would be seen from the manager's report that there was a good parcel of ore-stuff at surface ready for the crusher, sufficient to produce about 80 tons of dressed ore. This had been got chiefly in driving the 12 fathom level, and in the course of three or four months from this time he expected they would have stopping ground opened out that would enable them to make regular monthly sales, and in sufficient quantities, he hoped, to leave a fair margin of profit for the shareholders. But before this could be accomplished it would be necessary to raise about 2000l. to pay for machinery and other useful expenses at the mine; and, although the share list was but a small one, he was happy to know that it included the names of gentlemen who were well able to subscribe that might be required to make the mine a sound and lucrative investment, and he hoped they would be as willing as they were able. As he had said before, the operations had hitherto been limited to the canter lode, and he firmly believed that the produce of that lode alone would make a profitable mine. But he wished he could impress upon the minds of the shareholders the same strong conviction that he had on his own—that a very moderate outlay at two points of their great east and west lode would almost certainly result in such a development as would entitle their property to rank with the best and most profitable mines in the Principality. If the shareholders subscribed the capital now required he did not think he would be taking a too sanguine view when he said that they need not be surprised to see the Snowbrook Mine enter upon a long and prosperous career next year by paying its first dividend, with every prospect of its increasing with the development of the mine. And when they got fairly to work on the great east and west lode he believed the returns would be such as to astonish their friends, and make them all very well contented with their interest in Snowbrook. With regard to the mode of raising the capital, he had no hesitation in saying that the security the company were prepared to offer—a first charge on the mine and machinery—was a very substantial one, and such as in ordinary times would have enabled them to borrow the money on easy terms. Unfortunately, these were not ordinary times, but were just now a little out of joint, and the directors were quite prepared to offer exceptionally liberal terms. But, as the debentures would be offered *pro rata* to the present shareholders, they would all have an opportunity of participating in such privileges and profits as would, undoubtedly, be attached to them. He (the Chairman) concluded by moving the adoption of the report and balance-sheet, which was seconded and carried unanimously.

The election of Mr. Frederick Cates as a director, in the place of Mr. E. J. Hebb, resigned, was confirmed, and Messrs. T. S. Evans and Co. were re-appointed auditors for the ensuing year.

After a short discussion as to the terms on which the debentures were to be issued, it was left with the directors to decide, and the meeting concluded.

LITTLEDEAN WOODSIDE COAL COMPANY.

The annual ordinary general meeting of shareholders was held on Wednesday, June 26, at the Town Hall, Cinderford.—Mr. EDWIN CRAWSHAY (Chairman of the board of directors) presiding.

Mr. J. M. JOHNS (the secretary) having read the notice convening the meeting, the minutes of the last were read and confirmed.

The CHAIRMAN presented and read the accounts and balance-sheet, after which the following resolutions were carried:—That the accounts and balance as presented be passed and adopted; that Mr. Alfred Ridler be re-elected director; that Mr. George Morgan be re-appointed auditor; that a sum of 30l. be paid to the directors for their services during the past year; and that a vote of thanks be accorded to the Chairman and directors.

DIRECTORS' REPORT.

The directors of the Littledean Woodside Coal Company in presenting their annual report have to congratulate the shareholders upon the improved position of the company. Taking into consideration the continued depression in trade, it is satisfactory to know that during the financial year they had succeeded in realising a profit after payment of bank charges (355s. 2s.) and writing off interest on mortgage (192s. 1d.). Had it not been for the strict regard paid by your directors to economy being employed in every detail of the workings of the colliery, it would have been impossible to have obtained such a result in the face of so much depression, competition, and the low price obtainable for coal. With regard to the "deep breadth" now opened out for working, it is satisfactory to have to report that the coal has fully realised the anticipation of your directors. In substance the coal is bright and firm, and in thickness about 5 ft., yielding a fair proportion of block. In conclusion, your directors hope with the reaction in trade that may soon be constantly expected to still further reduce the price of the colliery, thus materially increasing the value of the shareholders' property.

[For remainder of Meetings, see to-day's Supplement.]

THE WEEK.

SATURDAY, JUNE 29.—The Van dividend of 5s. cannot but impress on holders that their shares at 22½ are too high—too high even when at 20, if there is likely to be a continuance of similar low dividends. Where mining shares are bought simply as a paying investment a return of 5 per cent. is not sufficient. No doubt with a better price for lead Van shares would at once rise 3s. 6d. each. Clementina, 1½ to 1½—by many considered to be a cheap share. Parys Mountain, ¾ to ¾. Aberdare, 8s. to 10s. Bodidris, 1 to 1½. Tankerville, 3½ to 3½. Pateley Bridge, 1 to 1½. Hultafall, 3½ to 3½. Roman Gravel, 7½ to 7½. Van, 22½ to 22½. Great Laxey, 17½ to 18.

MONDAY.—Van shares fell 1½, being offered at 21½. Colorado advanced to 6½; the sales of ore for May are announced to have exceeded \$15,000. Port Phillip, 11s. to 13s.; these shares should certainly go higher. For the month ending June 19 a profit of 1600l. was made. Javall, 6s. 6d. to 7s. 6d. Gold Run, 8s. to 8s. Don Pedro, 11s. to 13s., and neglected. A fall of ¾ was announced in the shares of the Pelsall Coal Company; shares with 15l. paid can now be had at about 20s. or 30s. Rhymney Iron are quoted 17 to 19, but such a price is not likely to be maintained. Halcote Back, 2½ to 3. Great Western Colliery, 2 to 3. Avenide Engine, 1½ to 2. South Wales Colliery, 4½ to 5½.

TUESDAY.—A moderate amount of buying continues to be done in Turkish bonds, but it is worth noting that whenever prices have been pushed up a little large sales are made, when the improvement is at once lost, and quotations remain flat until the more hopeful opinion of an increase in the price of the bonds is again without change, but the Fives have now again, for the third or fourth time, been lifted to 18l. Colorado mining shares, or "beetles" as they are more generally termed, were a full market at 6½ to 6½, while Richmond were in strong demand. WEDNESDAY.—Richmonds fell 10s. to 13½. Kapanga shares continue in re-

quest, and to-day reached 20s.; excellent profits can now be made by those who bought at 10s. and 12s. Don Pedro, 11s. to 13s.; Chicago, 10s. to 15s.; Flagstaff, 5½ to 7½. Last Chance, 1½ to 1½; Tankerville, 3 to 3½; Roman Gravel, 7½ to 7½. It is announced that the National Discount dividend will be 12 per cent., against 10 per cent. last year. General Credit is also expected to show an advance. Opportunities of buying both these shares very cheap have been frequent within the last few weeks, and have been more than once referred to in this article.

THURSDAY.—Shares of coal and iron companies in the local markets continue terribly depressed, and nearly all show a further serious depreciation, even on last year's ruinous drop. During 1877 Andrew Knowles shares not only maintained their par price but touched 4 prem., now they are at 6½ dis. Bolckow, Vaughan, from being at 9½ prem. have receded to 5½ prem., Henry Briggs from 5 prem. to par, and John Brown from 71 to 56. From being at 35 prem. the A shares of the Staveley Iron and Coal Company are now at 13 prem. Sheepbridge Coal have given way from 70 to 50.

FRIDAY (Opening).—The markets are inclined to be flat. Unified are down to 55, and Russian, 1873, to 55. Turkish Fives are only 15. There is a good demand for National Discount shares at a rise, owing to the increased dividend; the quotation is 10½ to 11. Mining shares show little fresh feature. Van, 21 to 22; Roman Gravel, 7½ to 7½; Great Laxey, 17½ to 18½; Devon Consols, 2½ to 3.

Two o'clock.—One or two stocks now show a rise on the day. Caledonian from being 110½ are now 111; Unified being ¾ better than at the opening. Hultafall, 3½ to 3½; Colorado, 6½ to 6½; Llanrwst, 2½ to 2½; Port Phillip, 11s. to 13s.; Javall, 7s. 6d. to 8s. Four o'clock.—The dividend of the Westminster Brewery Company, it is announced, will be 6 per cent. on the preference and 8 per cent. on the ordinary. Tiverton Brewery, 3½ to 4½; Miner's Safe, 8½ to 9; Chapel House Colliery, 3 to 3½; Richmond, 12½ to 12½; Colorado, 8 to 8½.

FERDINAND R. KIRK.

PRIVATE CIRCULAR MINING.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I have now before me circulars which I have lately received from five different firms dating from London, all recommending me to invest in the South of Eresby Mountain Lead Mining Company (Limited). I have not been able to find the names of any one of these "firms" in the columns of the *Mining Journal*, which I invariably consult in such matters; and another singularity is that they all, almost in the same language, in the same reports, and in the very largest type, recommend me the same mine, which is "rapidly advancing," but in which all have a few shares to offer. The last favour of the kind, which I received this morning, dates from Southwark, and offers me specially, and doubtless to some hundreds of other persons also, "85 shares at 1l. 10s. each." I am told that these circulars are flooding the whole country, and that widows and parsons are especially favoured with them. May I ask if any readers of the *Mining Journal* will favour me with the real price of these shares in the market, and whether the mine is such as these circulars represent? In see in your Share List it is in 30,000 shares of 1l. paid, and thus I am invited to buy shares at a higher price than D'Eresby Mountain itself stands at.

July 3.

A COUNTRYMAN.

[For remainder of Original Correspondence see this day's Supplement.]

RICHMOND CONSOLIDATED MINING COMPANY.

In a circular issued to the shareholders asking votes for Col. Stuart from those who have not given their proxies, Mr. John Baylies, accepting the challenge to make a comparison between the Richmond and Eureka Companies, says:—

The following figures will be instructive to the shareholders, and, let me hope, to the directors also. The Richmond management as compared with the Eureka management, both companies having ore of precisely the same nature, similar working conditions, and the same markets for the bullion they produce, from the year 1871 to the end of the financial year, August 31, 1877; compiled from published accounts of the respective companies:—

	Richmond Company.	Eureka Company.
Number of shares.....	54,000	50,000
Par value of share.....	£ 5 0 0	£ 5 0 0
Amount of calls paid up per share.....	5 0 0	5 0 0
Total share capital called up.....	270,000	250,000
Total receipts to August 31, 1877.....	1,793,108	1,625,280
Total expenditure to August 31, 1877.....	1,791,355	1,621,745
Dividends paid to August 31, 1877.....	18,768	230,100
Average smelting cost per ton of ore from the mine for 1875-77.....	3 18 0	2 8 0
Cost of fuel per ton of ore.....	2 11 0	1 13 0
General expenses per ton of ore.....	0 9 0	0 5 0
Dividends paid during the nine months from August 31, 1877, to May 31, 1878.....	60,749	270,000
Amount per share for nine months being.....	1 2 6	5 8 0
Total dividends per share from the commencement to May 31, 1878.....	4 11 6	10 0 0

During the two years ending Aug. 31, 1877, the Richmond smelted 68,707 tons of ore from the mine, at an average cost of 30s. per ton more than the Eureka, which represents a loss to the Richmond shareholders of nearly 2s. per share, or a total loss of 108,000l. in two years on this one item alone! It will be observed that the Eureka Company, having only 20,000l. of capital paid up, have paid in dividends 500,100; and that the Richmond Company, with its capital of 270,000l. fully paid up, in addition to the debenture debt, have paid in dividends only the small sum of 241,517l.; and it may further be remarked that the Eureka Company have spent on exploration, or "dead work," about ten times more than the Richmond Company. (See plan No. 7, in the book of plans and sections accompanying the committee's report.) These are the facts; and I ask, is it not time to effect some reform in the administration, not only in Nevada, but also in this country?

WATSON BROTHERS' MINING CIRCULAR.

Ten years ago the weekly information which had previously been published for a great number of years in *WATSON BROTHERS' Mining Circular* was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the *Journal* on the Clementina Mine.

In the year 1843, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. WATSON, F.R.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining," with Statistics of the Mining Interest, annually for 21 years, &c., &c. In the Compendium, published in 1848, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always a selected list on hand. Perhaps at no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and sharedealing than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

Messrs. WATSON BROTHERS are daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

WATSON BROTHERS,
MINEOWNERS, STOCK AND SHARE DEALERS, &c.
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

SATURDAY, JUNE 29.—Market generally very quiet. Van, 22 to 23; East Van, 37½ to 41½; D'Eresby Mountain, 80 to 100; Roman Gravel, 7½ to 8; Great Laxey, 17½ to 18½; D'Eresby Consols, 10 to 12; Leadhills, 3½ to 3½; South Conduarrow, 11½ to 11½; South Frances, 2½ to 3½; Tincroft, 10 to 11; Carn Brea, 39 to 41; West Tolgus, 59 to 61; Morfa Du, 12s. 6d. to 15s.; Parys Mountain, 7s. 6d. to 10s.; Richmond, 13 to 13½; Eberhardt, 7 to 7½.

MONDAY, JULY 1.—Market continues inactive, and prices, therefore, almost nominal. Carn Brea, 39 to 41; Devon Great Consols, 2½ to 3; Dolcoath, 29 to 31; D'Eresby Mountain, 80 to 100; D'Eresby Consols, 10 to 12; East Van, 37½ to 41½; Great Laxey, 17½ to 18½; Groswinden, 3 to 3½; Leadhills, 3½ to 3½; Morfa Du, 12s. 6d. to 15s.; Parys Mountain, 7s. 6d. to 10s.; Pateley Bridge, 1s. to 2s.; Roman Gravel, 7½ to 8; Roehope Lead, 17s. to 19s.; South Conduarrow, 11½ to 11½; South Frances, 2½ to 3½; Tankerville, 3 to 3½; Tincroft, 10 to 11; Van, 21 to 22; West Chiverton, 8 to 9; Agar, 3½ to 4½; Grenville, 3½ to 3½; Peavor, 6½ to 6½; Wye Valley, 1½ to 2; West West Valley, 2½ to 3; Richmond, 12½ to 13½; Eberhardt, 7 to 7½; Chontales, 10s. to 12s. 6d.; Javall, 7s. to 9s.; Frontino, 13½ to 14.

TUESDAY, JULY 2.—There is very little change in quotations since yesterday. Tincroft weaker at 9½ to 10½, Grenville 3 to 3½, East Van a shade firmer at 4 to 4½, and Richmond 13½ to 13½.

WEDNESDAY, JULY 3.—Market inactive, and quotations merely nominal. D'Eresby Mountain, 80 to 100; Van, 21 to 22; Great Laxey, 17½ to 18½; Tankerville, 3 to 3½; Roman Gravel, 7½ to 8; Parys Mountain, 7s. 6d. to 10s.; Pateley Bridge, 1s. to 2s.; South Conduarrow, 11½ to 11½; South Frances, 2½ to 3½; Agar, 3½ to 4½; Grenville, 3 to 3½; Peavor, 6 to 6½; West Tolgus, 59 to 60; Morfa Du, 12s. 6d. to 15s.; Parys Mountain, 7s. 6d. to 10s.; Richmond, 12½ to 13½; Eberhardt, 8½ to 7½.

THURSDAY, JULY 4.—Market very quiet, and prices about the same as yesterday. Richmond weaker at 12 to 12½.

FRIDAY, JULY 5.—Market very quiet, and prices nominal. D'Eresby Mountain, 80 to 100; Van, 21 to 22; Great Laxey, 17½ to 18½; Tankerville, 3 to 3½; Roman Gravel, 7½ to 8; Parys Mountain, 7s. 6d. to 10s.; Pateley Bridge, 1s. to 2s.; South Conduarrow, 11½ to 11½; South Frances, 2½ to 3½; Agar, 3½ to 4½; Grenville, 3 to 3½; Peavor, 6 to 6½; West Tolgus, 59 to 60; Morfa Du, 12s. 6d. to 15s.; Parys Mountain, 7s. 6d. to 10s.; Richmond, 12½ to 13½; Eberhardt, 8½ to 7½.

FOREIGN MINES.

ST. JOHN DEL REY.—Telegram from Morro Velho, dated Rio de Janeiro, July 2: Produce eleven days, second division of June, 11,750 oits; 15537; yield, 544 oits, per ton = 67 oits, by old measurement. All going on well.

DON PEDRO.—Captain Vivian, June 4: The produce for May amounts to 1526 oits. The produce is unusually small, which is attributable to the low quality of the ore, and which may improve at any moment. Judging from the promising appearance of the lodes at different points of operation, an early improvement is anticipated.—Mine: The exploring rise in back of No. 1 stop in No. 8 new shoot east (section 69) is up about 3 fms.; the last 6 ft. has passed through lode matter. Picked samples from the same are very good. The average of the ore is moderate. This lode is supported by some parties to be No. 5, as it is at about the same point where the shoot disappears. I am, however, not of the same opinion, and shall, therefore, continue the rise further, as the true position of No. 5 is higher up. The lode above referred to has a very promising appearance, and will of course assist the produce.—Drainage: Everything considered, good progress is being made in clearing and securing the sump-shaft below the 35. The deepest point reached is 32 ft. below this level, which will take a few days more to secure. This work is let on contract with a view of getting it done with all speed. The incline tramway is extended close down to the work, therefore there is no difficulty now in drawing the stuff. We can work one wagon here and another in No. 8 new shoot at the same time. For further particulars I beg to refer you to the mine captain's report.

Copy of Mine Captain's letter, dated May 31: General Remarks: The ore has been derived from No. 8 new shoot below adit level and Alice's West, and No. 8 old shoot, Bawden's cross-cut, north ground. The ore obtained of low standard.—No. 8 New Shoot: The branches of the lode in No. 1 stop east, below adit level, though of fair size, yet are at present of low quality. The No. 3 stop east below adit level, though having more lode matter than when reported on last, continues to produce low quality ore, but presents indications of improvement. The No. 4 stop east below adit level has communicated in the back to an old roadway, which somewhat militates towards its advancement; the branches, though somewhat smaller than when last advised, retain their moderate quality.—Alice's West: The progress in the northern stop towards Bryant's is somewhat slow in consequence of the excessive heat; we are now opening another shaft further to the west to throw more air in this stop; the branches promise (judging by their appearance) to improve.—No. 8 Old Shoot, Bawden's Cross-cut North Ground: A little has been done in Bawden's cross-cut at intervals; the end is still in broken ground. A little improvement has taken place in No. 4 stop east of cross-cut since last advised; the branches are larger, and of a little better quality. The lode in No. 5 stop east is of low quality. No. 6 stop east produces ore of moderate quality; the lode, though very small, is of fair standard. The branches in the south side from incline west from cross-cut towards Bryant's are of fair quality, but the ground is very hard and progress slow; the incline is still in bumpy ore ground.

Prospective and Running Work: In the 35 nothing has been done since last advised. At the incline shaft, considering the difficulties we have to contend with, stuff mixed with water and old timber, progress is satisfactory; the shaft is now cleared 5 fms. below the 35, and partly secured with large strong timber. In the adit level the tramroad is extended to shoot pass fixed below Symons' shaft, for convenience of transit of ores from Bawden's stop. At new level the exploring driving continues at intervals. No change as yet to note. In the stop east of Bawden's cross-cut several props and relievers have been put in, and pillars are being put in, to secure the roof.—Nos. 1 and 3 Stop East: Two props and three relievers sets have been put in No. 3 stop. In No. 1 stop, the old timber was crushing at this point. In the rise from the south side of No. 1 stop east we have cut some branches of very fair size and quality, at 2 fms. above the back laths of No. 1 stop, the branches being composed of yellow clay, ferruginous quartz, and specular jacting or micaceous iron. The rise is up 6 ft. in lode matter, which still continues. Two frame sets have been put in, the one east and the other west, to open out on these branches as soon as the rise is sufficiently high above them as not to endanger the prosecution of the same.

Bryant's cross-cut is still in hand.—Permanent Pumping Machinery: Two additional rolls have been put in to carry main rod in shaft, as the rolls were too distant from each other. The shaft kept in '4' fms., and windrope pinned, as we clean up the bottom around the lift.—Dawson's Machinery: The disconnection of this machinery is advancing slowly.—Wire Ropes: Changed a piece of wire rope which was badly worn and not trustworthy; two ropes working well, and hauling from both No. 8 new shoot and incline shaft.

RICHMOND CONSOLIDATED.—Telegram from the mine at Eureka, Nevada: Week's run, \$67,000, from 1050 tons of ore. Dore bars from refinery, \$60,000. Ore low grade.

R. Rickard, June 12: During the past week operations in the mine have been carried on vigorously, and with very good results. The winze below the 200 level is now being changed since my last. No. 6 chamber opening out well in the western end, there is a breast of fine ore 25 ft. high. No. 6 chamber is about the same. No. 7 chamber below the 400 is opening out well, and the grade of ore is of a good average. No. 8 chamber is not looking quite so well as it was; the ore is of lower grade. No. 9 chamber is improved, it is turning out some very good ore. A No. 10 chamber has been started from the drift which connects No. 7 chamber with the shaft; it is opening out well, a winze has been sunk 18 ft. perpendicular, and 12 ft. on an incline in very good ore; this winze will be sunk to connect with a rise now being made from an intermediate level 40 ft. above the 500. The 400 main drift is still in very hard limestone. The 500 cross cut has entered more favourable ground, consequently better progress is being made. The rise in back of the 600 level on quartzite is up 30 ft. in very favourable ground. The 800 level is being drifted on the quartzite, which shows favourable indications for ore. The ore body above this level is very much fallen off in value, stopping has been suspended for the time being. The 900 is still without change, the rise is up 35 ft. in the same favourable ground for ore, producing occasional stones of galena and carbonate ore. We are preparing to sink below this level. During the past week we had to stop the furnaces about 24 hours to make sundry repairs to the machinery which was the reason of the low returns.

COLORADO UNITED.—The advices of the superintendent, dated June 15, are as follows:—The ore sale for May, \$15,589.99. Our expenses have, of course, been very heavy, but not the less very small, and instead of paying out such large sums for the construction of the mill, dam, &c., we shall be reaping the benefit, and I shall certainly be able to cut the expenses down to \$10,000 per month all told. The mine is looking very well. In the Union tunnel the contractors finish to-day their contract for 100 ft. west on the lode. We put up a tender for a further 100 ft. at \$9 per foot; also a tender for stop No. 1 from the breast of the Union tunnel west for \$20 per fathom. The contractors started it on June 13. I was underground nearly the whole of last night, and when I left the mine I measured 9 in. of good mineral in this stop. This will be 100 very good news to the board and shareholders, and is most gratifying to me. In the silver drift, the silver is in the 100 ft. of the drift, and the grade of the vein here is very strong, and splendidly defined, and I feel sure we shall continue on mineral—certainly to the eighth level. The breast of the eighth level is again opening up nicely; the ore continues of good quality. We let the stop in the eighth level from winze No. 1 to winze No. 2 to stop up to the seventh level, at \$20 per fm. This stop, 175 ft. in length and 80 ft. in height, will I feel sure produce an enormous quantity of mineral it is a splendid block of ground. The screen cloth from Chicago I was obliged to send back; it is still alone now that is keeping us from starting the mill. It is, of course, very annoying; when I get this cloth I can fix up the screens, and have the mill running in a very short time. We have taken a good deal of mineral from the lower stop on the Breckenridge, but it is still of low grade, and contains a great deal of iron. No change to report in the silver ore shaft.

BIRDSEYE CREEK.—G. S. Powers, June 9: We got our extension-shaft through to gravel on May 30, at Walupia, and should now be prepared to work steadily had it not been for the sliding of the bedrock around the shaft, owing to the shaft coming up in such close proximity to the rimrock. We shall, I hope, in a few days get through with the slide, and shall then be in a condition to use water at least 12 hours out of the 24. As we were not in a condition to use water to advantage last month, we only used it at odd times, when it could not be run to advantage in Neece and West claim. We closed down Red Dog claim on May 30, owing to the water in the Star ditch running down so low that we could not make further use of it. The water run from South Yuba ditch during the last week of May, and was wasted during the breakage in the Birdseye ditch last February. We are only buying 300 in. from South Yuba ditch, and we are compelled to increase the bought head to 500 in., as soon as we can get the shaft clear at Walupia. We have only about 250 or 300 in. of Birdseye water at the most. We exploded a small blast in Neece and West claim, on the 5th, of 165 kegs of powder, which did its work handsomely; but as it is on the east rim we cannot expect it to pay as handsomely as the one washed off in May. We took from Neece claim 424 ozs.; Red Dog, 90 ozs.; Walupia, 47 ozs.; total, 561 ozs. Approximate value, \$10,000, as per cable of the 8th inst.

MINERAL HILL.—Mr. Plummer, June 8: South Giant and Star Mines: The communication between these mines has thrown them almost into one. All our available force has been employed breaking ore at this point. Our tramming from the Star Chamber has been continuous during the past week, and to-day we commenced to sort the ore with a new machine.

Plummer, June 12: I am pleased to report that we are still breaking ore between the South Giant and the Star. It seems to be spreading over the roof of the Star as well as under the west side of the Giant, which favours the idea that we have a large quantity of ore-bearing ground at this point. The ore asorters are making fair progress in assorting and collecting the ore, and I trust that by the end of the month we shall have an increase to our stock.

OREGON.—F. Ennis, May 30: I herewith enclose cost-sheet and vouchers for the month of April, and the weekly report for the week ending May 18: The clean up for April was 63 ozs. of gold. I shall not send it to the Mint until through the cleaning bench. The claim, however, will be in about two weeks. I have 300 inches of water in the ditches, and are using it at Thos claim washing in the bottom.

PONTGIBAUD.—July 2: Roure Mine: The sinking of the engine-shaft below the 175 metre level is resumed, and the ground is favourable. We have no change in the 175 cross-cut west. The 150 metre level south continues in a strong ore lode, yielding 1½ ton of ore per current metre. The same level north has yielded some good ore during the month, but is now unproductive. The 100 cross-cut east is in more favourable ground, but still spare for progress. The cross-cut in the same level west advances favourably. The 80 south, on Virginie's lode, yields stones of ore. The same level north yields a little saving work. The 60 north yields stones of Bruger's winze turned out well, yielding from 1 to 1½ ton of ore per current metre. The winze under the 150 metre level yields 1½ ton of ore per current metre. The 40 metre level north yields ½ ton of ore per current metre. The 40 cross-cut, east of Mill shaft, is in stiff ground, consequently our progress is slow. The 20, north and south of cross-cut, on the eastern part of the lode, yields a little ore, opening tribute ground. The adit, on the eastern lode, yields a little saving work. The Virginie adit, on the same lode, yields ½ ton of ore per current metre.

Mioche: The tribute pitches are without any noticeable change.—La Brosse: The 140 cross-cut east, south of Bassett's shaft, will be completed under the new engine-shaft in about a week, when the shaft will be commenced. The 100 metre level south is in soft unproductive ground. The 100 metre level south of air shaft, is in a strong lode, yielding a little low quality saving work at times. The 80 metre level south is unproductive. The 60, on the western part of the lode, is poor. The sinking of the engine-shaft below the 60 continues to go on satisfactorily.—Pranal: We have resumed the driving of the 110, north and south of St. George's shaft. The 90, south of this shaft, yields ½ ton of ore per current metre. The same level on the eastern part of the lode also yields ½ ton of ore per current metre. The rise in the 90, north of shaft, will be communicated with the

70 in a few days, and establish good ventilation up to this point. The 70 north yields ½ ton of ore per current metre. The same level south is unproductive. The 50 north is temporarily suspended to sink a winze a little behind the end; the lode is unproductive. The winze in the 30 south is down to level of the 50, but, being on the under part of the lode, is not yet holed; this part of the lode yields some good ore, worth ½ ton per current metre.—Surface: During the first part of the month our outdoor works suffered from continuous rains, but are now being pushed on with all speed. Our dressing operations have had a good supply of water, and our samplings have amounted to 300 tons. Villalongue: Having opened the back of the lode to the north of the level driven, we have found some good stones of ore, and in order to prove its value have set a shaft to sink vertically, which will intersect the lode at about 20 metres deep, where we hope to find it regular and productive.

PESTARENA UNITED (Gold).—July 2: The returns of gold for the month of June are as follows: From Val Topa district 146 ozs. 13 dwts., from 456 meagre tons of ore; yield per ton, 6 dwts. 10½ grs. From the Pestarena district, 319 ozs. from 10 dwts. 21 grs., 308 metric tons; yield per ton, 1 oz. 0 dwts. 17½ grs. Total from the two districts, 465 ozs. 3 dwts. 21 grs., from 764 metric tons of ore amalgamated.

ALAMILLOS.—June 26: The lode in the 20, west of San Felipe, is large and produces a little lead ore. In the 100, east of Taylor's, the lode is hard and poor. The 100, west of Taylor's, is now favourable for driving, but the lode does not contain any ore. In the 85, west of San Adriano, the lode yields a little ore, but not enough to value. The lode in the 60, east of San Victor, shows a few specks of lead ore. In the 70, east of San Victor, the lode became poor a few days ago. No improvement has taken place in the lode in the 70 west of San Victor. The lode in the 60, west of San Victor, has a promising appearance, and valued at ½ ton per fathom. In the 40, east of Judd's shaft, the lode continues to look well, and yielding 1½ ton per fathom. The lode in the 1½ ton per fathom, is a little wider than it was when last reported. In the 30, west of Judd's shaft, the lode is again producing stones of lead ore, valued at ½ ton per fathom. In the 40, south of San Carlos, a small branch of lead was intersected last week. The lode in the 40, east of Judd's, has fallen off in value, but still worth 1 ton per fathom. In the 50, east of Judd's cross-cut, the lode does not contain lead enough to value. The lode in the 70, west of Judd's shaft, is small and poor. In Hidalgo's winze, below the 85, the lode has fallen off a little in value, at present worth ½ ton per fm. The lode in Ortiz's winze, below the 40, is large, and producing good stones of lead ore, worth ½ ton per fathom.

EL PASO.—June 28: The lode in the 120, east of St. Tomas, has fallen off a little during the past fortnight; now worth ½ ton per fathom. At the 135, south of St. Tomas, we have cut through the lode, and have commenced driving east and west on its course; it is 6 ft. wide, consisting chiefly of spar, with good stones of ore. In the 100, east of Warner's, the ground is getting harder; lode worth 1 ton per fathom. The lode in the 115, east of Warner's, continues unproductive. In the 115, west of Warner's, the lode is large and kindly, consisting of a cleareous spar, with fine lumps of lead ore; worth 1 ton per fathom. The lode in the 120, west of Peill's, is getting very small in this driving; yielding ½ ton per fathom. In the 90, west of Peill's, there is a regular and well defined lode; worth 1 ton per fathom. The lode in the 120, east of Peill's, has fallen off a little; it is now well, at ½ ton per fathom. In the 115, east of San Francisco, the lode is hard and unproductive. The lode in the 90, east of San Francisco, is small, consisting of quartz and lead ore; valued at ½ ton per fathom. In No. 224 winze, below the 101, good progress is being made in sinking; lode worth 1 ton per fathom.—Quintones Mine: The lode in the 100, west of Taylor's, is small, and without ore. From the 100, east of Taylor's, the men are driving north, where we expect to find the main part of the lode. In the 90, east of Taylor's, the lode is disordered and unproductive. The lode in the 80, east of San Carlos, is large and kindly, containing a little ore; worth ½ ton per fathom.

FORTUNA.—June 26: Canada Inco's. The lode in the 120, west of O'Shea's, is large and open, and lets out water freely, yielding ½ ton per fathom. In the 30, east of San Carlos, the lode is regular, and contains good spots of ore. The lode in the 60, west of Abercrombie's, has become larger, and has also improved in value, producing ½ ton per fathom. From the 60, west of Abercrombie's, we are cross cutting to the main part of the lode, which we expect to shortly intersect. In the 50, east of Abercrombie's, a great length of good lead ground is being opened up, yielding 1½ ton per fathom. In the 70, west of San Pedro, the lode and ground are changing, and present a better appearance. The lode in the 80, west of San Pedro, is very large, composed of quartz and lead ore. In the 80, east of San Pedro, the lode is large, and yields occasional good stones of ore, worth ½ ton per fathom. The lode in the 70, east of San Pedro, has fallen off in value in the past few days, but still worth ½ ton per fathom. In the 120, east of O'Shea's, nothing of value has yet been met with, and the ground is very hard. The lode in the 100, west of Lowndes', is small, and entirely without ore. In the 100, east of Lowndes', the lode is gradually improving, and the ground easy, producing ½ ton per fathom. The lode in the 90, east of Caro's, though small yields good stones of lead ore, valued at ½ ton per fathom. Duke's winze, below the 60, has been holed to the 70; lode worth ½ ton per fathom. Pablo's winze, below the 50, is going down into a productive lode, valued at 1 ton per fathom. Diego's winze, below the 110, is being sunk in advance of the 120, east of O'Shea's engine-shaft.—Los Salides: In the 145, east of Morris's, there is a strong, fine lode, and yields splendid rocks of lead ore, worth 2 tons per fathom. The lode in the 130, east of Morris's, is disordered and poor. In the 120, east of Cox's, cross hole joints disturbed the lode, but it is again getting more defined, yielding 1 ton per fathom. In the 110, east of San Miguel, very good tribute ground is being speedily opened up here, valued at 2 tons per fathom. The lode in the 65, west of Palgrave's, is very small and poor, and the ground hard. At the 80, west of Palgrave's, driving commenced last week, very little has yet been done; lode worth ½ ton per fathom. The lode in the 85, east of Palgrave's, has decreased in value in the past few days; present worth 1 ton per fathom. In the 55, east of Palgrave's, the lode continues large and open, and yields little more ore, valued at 1 ton per fathom. Swaffield's shaft is off the lode, and good progress is being made. The lode in Boundary winze is of no value, and the ground hard.

AUSTRALIAN MINES.

PORT PHILLIP AND COLONIAL (Gold).—The directors have advised dated May 11: Quantity of quartz crushed on both the companies' and tributers' accounts for the four weeks ending April 24 was 4892 tons; pyrites treated, 30 tons; total gold obtained, 1684 ozs. 4 dwts.; receipts (including 1881. 14s. 3d. obtained from tributers), 3528. 2s. 3d.; payments (including 250l. for firewood, &c.), 2996. 10s. 9d.; profit, 1431. 11s. 6d., added to which was previous balance of 1549. 7s. 2d., making an available balance of 2980. 18s. 8d. The amount divided between the two companies was 1500. The Port Phillip Company's proportion of which is 846l. The balance was 1500. The directors have advised dated May 11: Quantity of quartz crushed on both the companies' and tributers' accounts for the four weeks ending April 24 was 4892 tons; pyrites treated, 30 tons; total gold obtained, 1684 ozs. 4 dwts.; receipts (including 1881. 14s. 3d. obtained from tributers), 3528. 2s. 3d.; payments (including 250l. for firewood, &c.), 2996. 10s. 9d.; profit, 1431. 11s. 6d., added to which was previous balance of 1549. 7s. 2d., making an available balance of 2980. 18s. 8d. The amount divided between the two companies was 1500. The Port Phillip Company's proportion of which is 846l. The balance was 1500.

TELEGRAM, dated Melbourne, June 29: Month ending June 19—Gold obtained from company's quartz, 375 ozs.; ditto from tributers' quartz, 1218 ozs. Profit, 150 l. Remittance, 750 l.

ENGLISH AND AUSTRALIAN (Copper).—The directors have advised from their manager, dated Port Adelaide, May 16: The stock of coal at Port Adelaide was 1507 tons. The smelting operations both at Port Adelaide and Newcastle were proceeding satisfactorily. Since the date of last advices a further shipment of 62 tons of copper had been made.

SCOTTISH AUSTRALIAN.—The directors have advised from Sydney, dated May 11: The sales of coal from the Lambton Colliery for the month of April amounted to 17,835 tons.

ENGLISH-AUSTRALIAN (Gold).—Capt. Raibeck, May 13: We have extended the cross-cut at the 420 ft. level 59 ft.; distance from shaft, 175 ft. At 152 ft. from shaft we intersected the eastern lode, and are now driving south upon the two, but expect the cross lode will soon take its former course. We may then expect quartz at any time. We have extended the drive at the 320 ft. level 40 ft. south. The country passed through has been very hard, but is now much easier, with a little stone making in the lode.—Prospecting Shaft: We have driven east upon the leader cut through 14 ft. from the bottom, also 8 ft. south and 6 ft. north, and have crushed from the same 22 tons of quartz; result, 11 ozs. retained, the rest fine gold, small, but payable, the above being the result of two men's labour for the month. I hope to be able to make a more favourable report next month. We have crushed 7 tons for tributers taken from surface leader; result, 18 dwts. of gold, the company to receive 50 per cent.

YORKE PENINSULA.—The directors have received advices from the Committee of Inspection at Adelaide, with reports from the Kurilla Mine to May 13. The following are extracts from Capt. Anthony's report:—Kurilla Lode: Hall's engine shaft is sunk 8 fms. below the 45, and the ground is much softer. * * * I am still driving north from the end of the 45 western drive. The rock, although of great hardness, contains veins of rich ore, and in one instance the vein is 2 in. wide, and east and west course. I am very hopeful of finding the main part of the lode north. The western stop in the 45 east is yielding from 4 to 5 tons of 20 per cent. ore per fathom, and the eastern one from 2 to 3 tons. * * * Morphett's Lode: After getting the 7-inch lift at work to pump from the 30 or bottom level I resumed sinking the engine-shaft. The lode was more or less disordered by a floor dipping from east to west, but on breaking through it the lode is found to continue with greater regularity, and is yielding 4 tons of 17 per cent. ore per fathom. I have called for tenders to sink 15 fms. My object in sinking 15 fms., instead of the usual 10 fms. lift, is to avail myself of a larger area of lode for stopping above the 45. Not having yet begun to stop the ore in the 30 east of shaft, and having still a fair reserve in the 20, I am hopeful of being able to sink to the 45, and extend the drives before the ore above the 30 is exhausted. By these means we shall lay open 50 per cent. more ore by the cost of sinking 5 fms. extra in the shaft, the drivages costing the same as for the 10 fms. lift. At the 30 east the lode is better than in the 20 standing above it in the same line. The best part of the lode in the 20 is still a considerable distance from the end of this drive. At the 30 west the drive is not yet far enough west to meet with the ore driven through in the 20 above. The 20 east has passed the wide shoot of ore said in my last to be worth 9 to 10 tons of ore per fathom. The ore is now more concentrated. On the north wall there is about 4 tons per fathom at 20 per cent. on which I am driving by four men, at 14. per fathom. Four men are cutting through the wide lode at the 20 east to ascertain its width and value, and to prepare it for stopping operations. As I intimated in my last, this is likely to be the best part of the mine. I beg also to confirm my remarks then made about the necessity of obtaining dressing machinery. The place at the 20, north of the main lode, reported in my last, has yielded ore enough to pay for exploring.

ORE RETURNS: 130 tons of ore had been shipped per Lady Douglas, leaving on hand at the mine on April 30 last 119 tons of 17 per cent. ore, and 670 tons of dredge ore of 5 per cent.

CORNISH PUMPING ENGINES.—The number of pumping-engines reported for May is 16. They have consumed 1536 tons of coal, and lifted 14.2 million tons of water 10 fms. high. The average duty of the whole is, therefore, 52,000,000 lbs. lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

	Millions	53.7
Melland—Gundry's 80 in.	53.7	
West Basset—Thomas's 60 in.	53.4	
West Basset—Thomas's 60 in.	53.4	
West Tolens—Richard's 70 in.	53.5	
West Tolens—Richard's 70 in.	53.5	
West Wheel Seton—Haley's 85 in.	53.9	
West Wheel Seton—Haley's 85 in.	53.9	
West Wheel Seton—Haley's 70 in.	57.2	

The directors of the West Prussian Mining Company have declared an interim dividend for the quarter at the rate of 1 per cent. per annum upon the A shares, and at the rate of 8 per cent. per annum upon the Preference Shares.

think, soon get into the main leader. I have an idea this is a lode, it carries a true course, and its underlie is now about 2½ ft. in 6 ft. We have driven over 10 fms. on it, and have met with spots of lead throughout the drive.

SOUTH TOLCARN.—Wm. Rich, James Knottwell, July 3: The lode seems to be improving as we get out of the influence of the small cross-course in the 24 end west. The 36 and east is in easy ground, and letting out water freely; the lode yields stones of copper ore.

TANKERVILLE.—A. Waters, July 2: The 206 cross cut south towards Tankerville lode is driven 1 fm. 4 ft., throughout which drive we met with several branches or strings well charged with lead ore. The men last night by boring a large quantity of water, and we have had to plug up the hole to-day, hole out a large driving until we have the lift, &c. fixed. These indications are not only very favourable, but go to show that we shall cut the lode much sooner than anticipated doing. We calculated we should have about 3 fms. to drive. The winze in the 192 west has much improved since last week, and is now worth 2 tons lode per fathom; lode 4 ft. wide. The winze in this level is now down 2 fms., lode 6 ft. wide, worth 1½ ton per fathom. The lode in the 192 east is 5 ft. wide, worth 2½ tons per fathom. In No. 2 winze, east of ditto, the lode is 6 ft. wide, worth 1½ ton per fathom. The winze in the 63, on the south lode, 4 ft. wide, worth 1½ ton per fathom. The stopes throughout the mine are as valued in my last week's report.

A. Waters, July 4: There is no material change to notice since my letter of Tuesday last. The 206 cross cut towards the lode is into strings of ore of good character, and we are expecting to cut the main lode in a good course of ore. The shaftmen are sinking for a fork previous to fixing a pump in the bottom of the shaft. We are sending off ore daily.

TEMPLE.—July 3: No. 1 level, driving west, by six men, at 51. 10s. per fm.; the lode is increasing in width, and the ore is becoming more promising, in appearance, composed of iron, slate, spar, carbonate of lime, with blende, and occasionally copper. A little lead, letting out large quantities of water. No. 2 occasionally copper, by six men, at 8. per fathom; the width of the lode is increasing, the ore clearing part opening out, and the lead spreading, although as yet not sufficiently to warrant an increase in the estimated produce—2½ tons of lead ore to the fathom. No. 3 level, driving west, by six men, at 9. per fathom; the lode is very strong in the bottom, but less so in the back of the level, producing without variation about 1 to 1½ ton per fathom. All surface works are progressing favourably, and weather suitable.

TRELEIGH WOOD.—William Goldsworthy, July 4: I beg to send you my report of the setting on Saturday. To sink a winze below the 44 by nine men, at 10. per fathom; lode worth 18. per fathom. To rise in the back of the 41 by two men, at 4. per fathom; not taken; the lode is disordered by a patch of killas. To stop in the back of the 44 east by two men, at 7s. per ton; lode worth 9. per fathom. We have five pitches working by 24 men, at tributes varying from 9s. to 13s. 10.

TYN-Y-FRONE.—E. Jones, July 3: The work of enlarging the main adit cross-cut is proceeding as vigorously as possible, and will soon, I trust, be completed. This has not only been a necessary part of the proper working of the mine, but has materially developed its character, showing that there is a succession of lode and branches of lode for fully 18 fms. between the mouth of the cross-cut and the existing level, in many places rich in blende, and with a mixture of lead and copper. This may be confidently expected to improve rapidly as it goes down.

VAUGHAN.—July 3: In the deep level east the lode is becoming harder, and letting out a great deal of water, being chiefly composed of a light clay-slate and branches of carbonate of lime. The stopes over the 30 and 20 are without change to report. At surface the carpenter is at work with the erection of a Zenor buddle, and the mason having completed the powder magazine will now commence building an ore bin.

WEST CRAVEN MOOR.—D. Williams, July 4: Blackhill adit level has been extended east the last 5 fms. 6 in.; the vein in the present end is 6 ft. wide, worth 15 cwt. of lead ore per fathom. No. 3 stop in the back of the level is worth 15 cwt. of lead ore per fathom. New Blackhill shaft is sunk 12 fms. below the adit, or 42 fms. from surface. I propose sinking 2 fms. more for a loom, and hope to commence cutting flat the latter end of next week.—New East Shaft: The 90 upon the No. 2 vein has been extended east of shaft 47 fms.; the vein in the forebreast is 1 ft. wide, producing spots of ore, and is promising for an improvement. No. 1 stop in back of level, by two men, worth 20 cwt. of ore per fathom. No. 2 stop in back of same, by four men; vein 2 ft. wide, worth 20 cwt. of lead ore per fathom. We have carted 32 tons of clean ore to the smelt-mill, which will be ready for sale next week.

WEST GODOLPHINE.—J. Pope, July 3: There is no change in the mine worthy of remark since my last report. In stripping down the side of the stopes in the 70 west, on Wilson's lode, we are breaking good quality stuff.

WEST PATELEY BRIDGE.—David Williams, July 4: The 26 or intermediate levels are extended east and west of shaft 5 fms. 3 ft. In the west end the vein is 18 in. wide, consisting of limspare, barytes, and intermixed throughout with a good mixture of lead ore. In the east end the vein has been rather nipped, but appears to be opening out again and improving in value as we approach the ore-bearing beds, dipping east from the level above, at present 1 ft. wide, and producing stones of lead ore. The 20 east has been extended during the month 7 fms., and is now about 40 fms. east of shaft. The vein is present very favourably, being over 3 ft. wide, composed chiefly of limspare, gossan, and lead ore, the latter being saving work for dressing of good quality.—Craven Cross Shafts: The north shaft is sunk and secured to a depth of 38 fms. below surface. I have ordered a second drum, and also pulleys and a wire rope, to connect and enable us to draw from these shafts with the engine.—56 fm. level: The 63 has been extended during the month 6 fms. in a vein 4 ft. wide, worth for lead ore about 16 cwt. per fathom. Two men to stop in back of level in a vein 4 ft. wide, worth 25 cwt. of lead ore per fathom. Hauling and dressing carried on as usual.

WEST ROSKEAR.—H. Stephens, W. Bennett, July 4: We set the large engine to work last evening; it started as well as could be desired, and will do its work with ease. We sink Stephens' and Lanyon's shaft to sink below the 12 and the 24 to drive, which we calculate to get drained in readiness to commence vigorous working by Monday next. There is nothing new at present in any of our underground operations.

WEST TANKERVILLE.—Arthur Waters, July 2: The 88 fathom level south is in a lode worth 15 cwt. of lead ore per fathom. The lode in the rise in the back of this level is worth 1 ton per fathom. The stop in the back of the 75 is worth 12 cwt. per fathom. The stop above drift, on the west portion of the lode, is worth 1 ton per fathom. We are stripping down the lode below the adit drift, and the yield is 15 cwt. per fathom. The drift below the 63, on the west portion of the lode, is worth 2½ tons per fathom. All other points as for some time past. We shall have delivered the 20 tons of blende to Ministry to-morrow. I enclose certificate.

July 4: There is no change of note here since my report of Tuesday's date last. We have to-day sold 30 tons of lead ore, for 308l. 5s.

WHEAL CREBOR.—J. Andrews, July 2: There is no change in the 120 east during the past week, as we are still driving by the side of the lode. The lode in No. 1 stop has fallen off in value, which is now 4 ft. wide, yielding a little saving work, but not sufficient to value. This falling off I regard as temporary, and believe it will soon change again for the better, as there is a good lode going on in the bottom of the 108 immediately over the stop. The lode in No. 2 stop, in back of the 120, is 5 ft. wide, worth 15. per fathom. The lode in the 108 east is about 6 in. wide, and yields a little mud and copper ore, but nothing to value. The 72 and 48 ends are poor. We continue to make fair progress in sinking the new shaft, but the lode is without change.

WHEAL GRENVILLE.—T. Hodge, July 4: Fair progress is being made in sinking Gould's shaft below the 150, and we calculate to reach the flat lode in another 6 ft. sinking. The 140 east end is worth 8. per fathom. The 140 west end is worth 6. per fathom.—Western Shaft: The sumpmen are engaged cutting the tip-plate at 10. 10s. per fathom. The lode here is producing moderate stamping work, and the yield is 15 cwt. per fathom. The 120 east end is worth 4. per fathom. The 140 east end is worth 7. per fathom. The 130 west end is producing low price tinstone. The stopes in the back of the 150 east are not quite so productive as hitherto. No other change in the underground departments. All surface work is being pushed on as fast as possible. The south axis is fixed in its place, and we are now engaged taking out ground for the round buddle, in order to sink the same at an early date. We have now 58 heads at work.

WHEAL KITY (St. Agnes).—S. Davey, R. Harris, June 29: The men in the various bargains throughout the mine have in the past week been desuing the lode, consequently there is no change to report.

WHEAL MAHY HUTCHINGS.—H. Bennett, July 3: I am very pleased to inform you that the kilns are now working well, and that the lode for arsenical mud is still very productive, and no doubt will continue for a long time, as we have ground enough already laid open to last for many years, beside tin.

WHEAL NEWTON.—H. Bennett, July 4: Setting Report: The engine shaft to sink below the 41, by nine men, at 14. per fathom; the lode is 18 in. wide, composed of flookan, quartz, and carbonate of iron, presenting a very kindly appearance. A winze to sink below the 30 east of shaft, on the north part of the lode, by four men, at 7. 10s. per fathom; the lode is 2 ft. wide, composed of flookan and carbonate of iron, and a little silver; it being, in fact, one of the kindest lodes I have ever seen, and we are daily expecting an improvement for silver as we approach the large cross-course.—Cook's Shaft: The 50

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IRON.—The enquiries for this metal are still extremely limited, and there is not the least sign of any improvement. Sellers have the greatest difficulty in obtaining current prices, but if the demand were to increase to any great extent just now it could not be satisfied, for the hot weather would prevent the men from working more than very short hours, and puddling could only be proceeded with under very severe hardship. Some of the works already given notice that after the present hot bloomers are exhausted, delivery may possibly have to be deferred, but although the output will probably for some little time to come be very restricted, yet the market continues to assume a downward tendency, and in opposition to many in the trade, who have lately taken a more sanguine view of the market, we have repeatedly asserted that there were no grounds for an advance, and circumstances now prove the correctness of our opinion. The shipping demand in London is very dull, and sellers are offering to make concessions, which is about the strongest evidence, considering the falling off in the make, that could be adduced in favour of the metal. We have no sufficient orders to keep them going at the present time, but have been decidedly with regard to the market attempting higher rates, and have advocated reduced prices in order to defeat competition, as well as to stimulate the demand, but our reasoning upon the subject has been extremely moderate in comparison with what has just transpired among

THE IRON TRADE.—(Griffiths's Weekly Report).—Friday evening The Glasgow warrant market has been inanimate this week. It opened fls this morning and closed, with buyers, this afternoon at 49s 9d., a loss on the week of about 4d. per ton. We quote makers' No. 1 iron:—Gartsherrie, 50s; Coltness, 61s.; Calder, 58s.; Langloan, 58s. 6d.; Snammerlee, 58s. 6d.; Monkland, 51s., f.o.b. Glasgow; Glengarnock, 56s.; Eglinton, 51s., f.o.b. Ardrossan; Shotts, 59s., f.o.b. Leith. The July Quarter-day will be held at Birmingham next Thursday, and at Wolverhampton the Wednesday before. There will be a change declared at either of these Quarter-days in the price of finished iron. Marked Staffordshire bars will continue to be sold at 87s. 10s. per ton; the Edgely of Dudley's bars 12s. 6d. extra—viz., 9s. 2s. 6d. per ton. There will be no reduction in pig-iron. Shropshire and Staffordshire best brands and hematites made in the West of Scotland will continue to be sold at 47s. 6d. per ton. There have been no sales during the last month—the basis being 4s. per ton for Lilleshall forge-iron. Mr. Isaac Wilson, a well-known ironmaster in the Cleveland district, is returning member of Parliament for Middlesbrough, filling up the vacancy occasioned by the lamented death of Mr. Bolckow.

Our market this week has been remarkably quiet; prices are firm all round, and for second-class Staffordshire iron for immediate delivery half-a-crown more money has been paid in several instances. We have no large contracts to report this week in rails or any other kind of iron, for the former quotations continue very low. The bulk of the business in ship plates continues to be done by the mills in the North of England. We can report no improvement in the demand for boiler-plates and these latter are still in the mill-roller department, and considerable orders are expected to be given in Quarter-days for this class of iron. The Middlesbrough market continues firm for pig-iron, and although business was somewhat restricted on Tuesday future prospects are improving in this market. The Glasgow

LEAD MINES show more activity than copper or tin, but business is very much restricted, and there is great difficulty in finding buyers when shares, even in the best mines, are offered for sale.

Mines inspected and reported upon.

Notices to Correspondents.

MINING JOURNAL VOLUMES WANTED.—Any subscriber possessing duplicates of Vols. I., II., IV. (A.D. 1835, &c.), and willing to dispose of them, will oblige by sending particulars of price, condition, &c., to the Editor, *Mining Journal* Office, 25, Fleet street.

BAMFYLDE—WHEAL WHISPER.—Can any of your correspondents tell me what these companies are doing? No reports are sent to the proprietors as I can hear, and some months ago it was said that the Bamfylde Company was in liquidation, and that a new company was about to be formed to work the mine. Has the Wheal Whisper collapsed, or is the work still being carried on there?—G. W. COPPER EXTRACTION.—The letter from Dr. Ad. Gurit shall appear next week.

Received.—"W. E." (New York)—"S. C. F." (San Francisco)—"S. W."—"Shareholder" (Exchequer)—"B. M."—In last week's *Journal*, the reference to Llanrwst Mine should have read does not seem to be keeping its machinery fully employed—"Engineer" (Manchester)—"E. J. B."—"Shareholder" (Huntington)—"Constant Reader" (Belfast): The information can be obtained by writing to the office—"Beacon" (Next week).

THE MINING JOURNAL, Railway and Commercial Gazette.

LONDON, JULY 6, 1878.

EXPLOSIONS OF COAL GAS ON BOARD MERCHANT VESSELS.

Recklessness with respect to the gases given off by coal, it is to be regretted, is not confined to the working miners, or at least a portion of that body, but can now be attributed to persons engaged on board our merchant vessels in different capacities, so that, notwithstanding the warning recently given by the explosion at Newport, in South Wales, a similar catastrophe took place in the same part of the Principality on board the steamer *Cadmus*, while lying at Penarth, and was to have sailed the same night for Aden. The vessel was coal-laden, and it appears one of the trimmers, without the slightest consideration, took a naked light into the fore hatch, when the accumulated gas led to an explosion, so that four men were injured seriously and two slightly. Perhaps it was just as well that this should have occurred at the time it did, when the vessel was in harbour, for it is quite probable that when on the voyage some equally reckless seaman or stoker might have taken a light into the same place, when there would have been a larger quantity of gas, and so caused an explosion that might have led to the entire destruction of the vessel and all on board of it. Ventilation in the hold of a vessel full of coal is as necessary as in the mine where the coal itself is gotten, but this is frequently overlooked, and the recommendations of the Royal Commission on the spontaneous combustion of coal in ships, adopted by the Board of Trade, and brought under the notice of coal shippers, wilfully disregarded. It was in consequence of such neglect in carrying out the views of the Board of Trade that the *Annie Richmond* was entirely lost, as shown by the report of the board of enquiry. Underwriters could do a great deal towards enforcing the simple regulations laid down for vessels carrying coal, by ensuring them conditionally on the cargoes being efficiently ventilated, as could be done without much trouble or inconvenience.

There are, however, some descriptions of coal that give off a great deal more gas than others, and where there are cargoes of such more than ordinary care should be exercised, not only in admitting as much fresh air as possible to penetrate the places where it is stowed, but in preventing naked lights from being taken near to them. As the gas always rises to the top, owing to its lightness, it would be well for those who have the command of coal-laden vessels to have the hatches or other covering left open from time to time, so that the gas could escape, for when, through its acknowledged subtlety, it is allowed to penetrate into a part of a vessel, it may be for sleeping or other purposes, it would easily combine with the air, and so form an explosive mixture. This appears to have been the case with respect to the late explosion on board the steamer *Sardinian*, one of the well-known Allan line of vessels, according at least to the evidence taken by the Wreck Commissioner. In the main lower hold of the *Sardinian* we are told that there were stored 400 tons of coal of a highly gaseous character, and there was given off on an average 44 ft. of gas per ton of coal daily, so that the quantity that exuded every 24 hours was more than sufficient when mixed with the air between decks to form a highly explosive mixture that only required a naked light to explode at any moment. All was right on board the *Sardinian* up to the starting on her voyage, the hatches as usual being fastened down. However, in about 24 hours after starting one of the men thoughtlessly went into the place where the coal was with a naked light, and the result was the explosion, with the loss of four lives. To those at all acquainted with the gaseous nature of certain coal seams this would cause not the least surprise, although it might do to seamen used to cargoes of coal, and who in all probability consider that all coal is the same. But on this point all persons engaged on board vessels where cargoes of coal are carried should have their minds disabused, and the danger attendant in the conveyance of such dangerous material clearly made known to them. Commanders to whom the lives of so many are entrusted, should not be allowed to put in the plea of ignorance in the event of an explosion taking place, owing to the accumulated gas from coal being either set fire to, owing to a naked light, or where spontaneous combustion takes place, owing to the non-ventilation of the places in which coal is stored, either as the whole or part of the cargo.

So far as the explosion on board the *Sardinian* is concerned, it was suggested during the enquiry that it might have taken place owing to dynamite or some other powerful explosive having been smuggled on board either in the cargo or in some of the passengers' luggage, and by some means went off. But this was shown not to have been the case, for Mr. ROTHERY, the Wreck Commissioner, said the suggestion completely failed to account for the occurrence, and that "it was established beyond a shadow of doubt that the explosion arose from the gas in the 400 tons of coal stowed in the main lower hold having been allowed to accumulate in the 'tween decks above to such an extent as to form with the air an explosive mixture, and the fact of a light having been taken down into the compartment after the hatches had been securely fastened down." This mode of stowing coal it appears is not at all an unfrequent one, according to Mr. ROTHERY, for he informs us that it had been given in evidence before him by the surveyors appointed by the Board of Trade, as well as by the emigration officers, "that they frequently passed vessels with 400 or 500 tons of coal in one compartment with no means of exit for the gas, and with a large number of passengers on board." This is certainly an unlooked for and startling statement on the part of men who are appointed by Government to see that vessels before leaving a port have no element of danger about them in any direction that it is possible to prevent. We can scarcely believe that the Board of Surveyors are really ignorant of the danger attending the carrying of coal, yet such is about the only conclusion that can reasonably be come to, seeing that they pass vessels laden with coal from which the gas cannot escape, but may be set fire to by a seaman or any ordinary person, who could scarcely be expected to have a knowledge of that of which Board of Trade Inspectors appear to be ignorant. The witnesses as to the explosion on board the *Sardinian* also stated that they were not aware that it was necessary to have the means of ventilating coal cargoes so as to prevent accumulations of gas on board of vessels.

We had thought that after the Report of the Royal Commission on the Spontaneous Combustion of Coal in Merchant Vessels the Government officials at the various seaports in the kingdom could not plead ignorance of the dangers attending the carrying of coal from the gas that is given off. It appears, however, that we have been mistaken, but now that the danger has been brought clearly before them it is to be hoped that they will in future enforce, so far as they can, the views of the Board of Trade, the neglect of which, as we previously pointed out, led to the loss of the *Annie Richmond*,

and it may be of many other vessels, as to the loss of which we have no official information. Passengers and underwriters being now aware of the danger attending the carrying of coal from certain districts in particular, it is to be hoped, so as to ensure the safety of those on board of vessels, as well as the vessels themselves, will be more particular than they have been in seeing that ample provision is made for the escape of gas from coal cargoes. Ocean steamers, we are told, carry large quantities of coal all the year round, and that in going from Liverpool to America, or to other distant ports, no explosion has taken place. We are certainly not aware that any explosion has ever taken place in Liverpool from coal in bulk, but from the report of the Royal Commission it appears that they have taken place in the ports of Cardiff, Swansea, and Newport. This shows that Welsh coal gives off more gas than that of other districts. A great deal of the South Wales coal is very soft, and, of course, in being discharged into the hold of a vessel get broken into comparatively small pieces, so that the gas it contains comes out more freely than would be the case with respect to large and very hard coal. A good deal of the coal shipped at Liverpool is lumps of fair size, so that the gas does not escape so easily from it as in the small and soft qualities. From Hull and Grimsby also thousands of tons of Yorkshire "hards," as the steam coal is termed, is sent weekly to different parts of Europe, yet we are not aware of any explosions having taken place from the gas coming from it, South Wales, so far, having the credit for those that have occurred. But there is no reason why precautions should not be taken at all our ports so as to ensure the safety of all persons, seamen and passengers, who have to travel by sea. Surveyors and others, into whose care the lives of thousands are entrusted, cannot now plead ignorance as to the danger connected with coal cargoes, and it is to be hoped that the Government will see that the officials appointed by the President of the Board of Trade do not pass vessels in the manner they have done, by refraining from carrying out the recommendations of the Board itself.

RAILWAY PROSPECTS.

We cannot shut our eyes to the fact that the prospects of the principal home railways have rather changed for the worse during the past half-year, and that this is an adverse element in the future of the iron trade. It is true that the lighter pleasure lines, such as the London, Brighton, and South Coast, the London, Chatham, and Dover, and the South-Eastern, did pretty well during the first half of 1877 (having benefited, to some extent, from the special movement associated with the Paris Exhibition); but the case is very different when we come to deal with the heavy lines connected with Wales, the North of England, and Scotland. These latter systems have generally suffered more or less from labour difficulties and the stagnation of the times. The Great Eastern certainly increased its revenue 25,488, last half-year, and the Great Northern followed suit with an augmentation of 22,239. The Midland advanced 21,687, and the Manchester, Sheffield, and Lincolnshire, 5009. These increases scarcely keep pace with the increase of capital upon the Great Northern, the Midland, and the Manchester, Sheffield, and Lincolnshire; but still they are better than no increases at all. When we come to deal with the Lancashire and Yorkshire and the London and North-Western, we are brought face to face with the difficulties of the hour in all their intensity, the receipts of the Lancashire and Yorkshire having fallen off 33,349, and those of the London and North-Western 24,548. The North Eastern has fared worse than any of its neighbours, its revenue having again declined to the extent of 139,097. The earnings of this system have been slipping back continuously since 1874, and the dividend upon North-Eastern Consols must present a further sensible contraction next month, notwithstanding the fact that some reduction was probably effected during the past half-year in the working expenses. The extreme weakness of the Cleveland iron trade has, of course, told with great and continued severity upon the revenue of the North-Eastern, and we are afraid that the holders of North-Eastern Consols have not seen quite the end of their difficulties. The Caledonian has also suffered greatly during the last few months from the depression of the iron trade in the West of Scotland. The decline in the earnings of this great Scotch system thus far in the half-year ending July 31 has been 69,940. Similarly the receipts of the Great Western have fallen off 27,556, that company being a sufferer from the exhaustion and weakness of the coal and iron trades of South Wales. The North British comes out of our examination almost as badly as its old antagonist the Caledonian, the revenue having receded to the extent of 23,877.

We have gone into these details for two reasons—first, because an intrinsic interest is now attached to the affairs and operations of our great railways; and, secondly, because the prosperity of the railway interest is very closely associated with the prosperity of the iron trade. When times go well with the leading railways of the country, their directors are far more disposed to proceed with extensions, sidings, and duplications than they are in periods of declining ordinary stock dividends. Having regard to the great and continuous increase of capital which has been taking place upon such concerns as the Midland, the London and North-Western, the North-Eastern, the Caledonian, or the Great Western, we do not see how it is possible for those companies to avoid some reductions in the distributions about to be made upon their ordinary stocks. It may happen that the falling off in receipts, or the absence of the usual elasticity in receipts, may be compensated for by substantial reductions in the working expenses. This may certainly be the case upon the Midland and the London and North-Western; but upon the North-Eastern, the Lancashire and Yorkshire, the Caledonian, and some other great concerns, ordinary stockholders will have, we fear, to make up their minds to accept lower dividends. If so, they will probably grumble, and induce directors to proceed more cautiously with new works.

THE MANUFACTURE OF COKE.

AITKEN'S HOT AND COLD BLAST PROCESS.

It has been pretty generally assumed by our ironmasters that the quality of coke in ordinary ovens depended upon the time taken up in the process, and that an inferior quality was produced owing to insufficient time being allowed for its manufacture. This view, we believe, may be considered a correct one, but there is certainly no reason why the process may not be accelerated by means outside of those generally adopted. As we have reduced by 50 or 60 per cent. the quantity of fuel formerly required to make a ton of pig-iron, it certainly appears quite as easy to reduce the time for converting coal into coke, and this appears to have been accomplished by the process patented by Mr. AITKEN, and now being adopted at several collieries in Yorkshire and the North of England. A great deal of the coke now made is from small coal, for it has been found that a higher percentage is obtained when the material is put into the oven in a powdered state than when it is not crushed, the coke being also harder. By the patent process Mr. AITKEN takes credit for a saving of time in coking of 20 per cent., and that instead of producing 100 tons by the ordinary method his ovens will yield from 120 to 130 tons of coke from the same quantity of coal. In addition to this, the gases can be utilised for boiler and other purposes. From each oven, we were informed by Mr. COOKE, of Sheffield, 12-horse power could be obtained for generating steam both night and day whilst six of the ovens would be sufficient for a Galloway boiler 30 ft. long and 7 ft. diameter. The yield of coke, as ascertained in South Yorkshire lately, has been 65 per cent. for ordinary Silkestone smudge, at a cost of 2s. 6d. per ton. The patent principle can be applied to the ordinary beehive oven, which it is admitted produces the best quality of coke, and by the AITKEN process such ovens can be made to yield within from 2 to 4 per cent. of the actual yield of coke contained in the coal. The Thornecliffe Silkestone coal was found to have an average of coke in it, as determined by retort, breeze included, of 65.63 per cent., and the average yield by the patent process, free from breeze, was 62.65 per cent. At Almond Ironworks, near Falkirk, the trials made proved that with average charges of 3 tons 4 cwt. of coal the average time from charge to discharge with the patent blast oven was 62 hours, whilst to coke the same

coal in the ordinary way 80 hours would be required. The yield, too, was much greater than in the beehive oven, for however careful amount of carbon theoretically contained in the coal, in some cases 20 per cent. of carbon being destroyed by oxidation.

By the hot and cold blast system after the oven has been dried and heated it is charged in the usual way, and as soon as the heat has caused sufficient gas to be evolved to produce combustion the blast is turned into the oven above the surface of the coal to be coked. The introduction of the air by blast creates at once intense heat, which again causes more gas to be given off, and to meet this the amount of air is regulated by the blast, so that in the mixture of carburetted hydrogen and air in the oven over the coal there is always some gas unconsumed. The heat caused by the blast is very high, but as the air is directed above the surface of the burning coal, and not through it, only the coal gas (carburetted hydrogen) is consumed in the process of combustion and the generation of heat, whilst the solid carbon in the form of coke remains at the bottom of the oven entirely unaffected by combustion, which goes on above it—hence the increased quantity of coke produced by the process. For many years past attempts have been made in Durham and other counties to utilise the heat which escapes from the ordinary coke ovens, but this until lately has not been accomplished. Many of our coke makers, however, have been more successful in making available a good deal of the coal which if used as sent out of the pit, owing to its impurities, would not make coke suitable for blast-furnaces. It has also been found that the small coal of but little commercial value for ordinary purposes can be converted, either washed or otherwise, into very good coke, more particularly by the process patented by Mr. AITKEN, which has also the great advantage of taking the gases not required to boilers if near to the ovens. At some places this would effect a very great saving indeed, for drawing and pumping engines could be kept in full operation without any expenditure of coal whatever. By the patent system it has also been shown that the rapid combustion, so far from deteriorating the quality and quantity of the coke, actually gives a larger yield and a superior quality as compared with the ordinary ovens.

GOLD MINING UNDER RIVER BEDS.

Considerable attention is at present being directed in America to a new air-compression tunnel and mining tube for reaching the bedrock of rivers and tunnelling with safety beneath the waters, invented by Mr. H. R. LEONARD. It is remarked that 20 years ago not a few got wealthy in a day by working the auriferous deposits in the beds of several of the chief rivers of California, and although difficulties then insurmountable prevented the continuance of that branch of industry, it is believed that by Mr. Leonard's invention the river deposits will be made as remunerative as ever. Mr. Leonard remarks that it is not his wish to convey the idea that the bedrocks of all the rivers in California are covered with gold in as great abundance as is here quoted of portions of bedrock that have been worked on the Yuba; he simply wishes to state that in numerous cases within his own knowledge, and in very many cases of which he has learned from the experience of others, large quantities of gold have been gathered from the bottoms of our rivers, and he now provides a means for protecting the miner and enabling him to obtain all the gold that is on the bedrock where he works. It is believed, however, by the inventor, that his air-compression tunnel and mining tube will afford the means of practically solving this great problem, and that tunnelling under the bed of a river will be made comparatively easy and entirely safe.

The apparatus appears to be very simple and easy of application. An iron tube of suitable diameter in sections of convenient length, bolted together and made air and water tight, is driven through the sand and gravel to the bedrock by pneumatic force. Where its sinking is retarded by rocks, these can easily be removed by blasting in the ordinary way of sinking shafts. The tube, when completed, is supplied with proper air locks at the top and bottom. These at the bottom of the tube are four in number, each of three chambers, and each of these provided with doors for ingress and egress as required. As many as 40 men can be worked on one claim with perfect freedom of action. The tunnelling over the bedrock is performed like ordinary tunnelling, and the water entering the tunnel from seepage or otherwise is driven out by atmospheric pressure, by air compressors, operated by steam-power, and is kept out by the same atmospheric pressure under which the miners work. All proper appliances are provided for hoisting by steam in the usual way. The tube and chambers are well provided with safety valves, gates, &c., so that the workmen can, at their own convenience, protect themselves from over pressure of air. The great advantages claimed by this means of operation are that the miners are able to tunnel over the bedrock and pick and scrape up the whole surface, and can see the work before them and save all the gold within the claim. By the use of this apparatus the miner can work all the year round, being in no way affected by the high water. So fully confident is Mr. Leonard of the successful operation of his invention that he announces himself ready to put up his machinery on any claim and wait for his compensation till it is a demonstrated fact.

COLLIERY EXPLOSIONS AND THE MICROPHONE.—Mr. Charles E. de Rance, F.G.S., Associate Inst. C.E., Her Majesty's Geological Survey, Chester, writes:—"Professor Hughes has recently informed the Physical Society of the varied applications of practical value to which his remarkable invention, the microphone, has already been put. It has occurred to me its operation may be extended to the possible prevention of colliery explosions. All who have visited a fiery mine have listened to the peculiar hissing sound given out by pores and joints in coal seams from which gas is being evolved, varying in intensity with the quantity delivered. Could not a combination of those wonderful inventions—the microphone and telephone—be constructed so that the sounds emitted underground may be reproduced in the colliery office, and a permanent record be kept by means of the phonograph? This, consulted every morning by the firemen previous to their daily inspection of the mine would indicate not only to a certain extent the quantity of gas given off; but the exact part of the mine from which it has been given off; for several transmitters might be placed in each coal seam, and a separate phonograph, connected with each receiver, in the office. Should this be found practicable, the importance of daily telegraphic exchange of results is obvious, when it is remembered that the cause leading to extensive outburst of gas at a particular colliery are experienced over a wide area.

AMERICAN LOCOMOTIVES FOR AUSTRALIA.—The Baldwin Locomotive Works at Philadelphia have received an order for two large and powerful locomotives for the New South Wales Government railways. The Baldwin Company turned out one engine daily during June.

STEAM BOILERS.—The improvements suggested by Mr. E. de Lorraine, of Chelsea, consist in constructing an internally fired boiler with flues oval at the front and cylindrical behind. This tubular flue is furnished with a number of vertical tubes, diminishing in diameter from the front to the back, so that the size of the tube may be proportionate to the quantity of heat remaining to be taken up. The fire-bars are used slightly inclined from the front to the back of the boiler. The invention was provisionally specified, but the patent was not further proceeded with.

COATING SHEET-IRON WITH TIN OR LEAD.—In the ordinary method of coating sheet-iron with metals and metallic alloys, fusible at or below a red heat, the sheets, after having been properly cleaned, are passed through a bath of melted metal or alloy, each sheet being either guided to and passed between plain rolls or dipped without the use of rolls, as is well understood. The coated sheet, after passing from between the rolls or under the bar, is guided to the tongue face of the bath, where it is taken hold of and removed by the tongs of the workman. The invention of Mr. R. HEATHFIELD, of Birmingham, consists in placing an additional pair of rolls in the bath of melted metal in the path of the sheet as it passes from the principal or ordinary rolls, whereby the coating of the sheet is much im-

proved. The axes of the additional pair of rolls are situated in a plane at or nearly at right angles to the plane of the ordinary rolls used in coating iron, the said additional rolls being situated at such a level that the coated sheet is operated upon by them either just before or just after it leaves the bath of melted metal. Although in practice he has found that one additional pair of rolls is sufficient for ordinary purposes, yet two or more additional pairs of rolls placed in a plane at right angles, or nearly at right angles, to the plane of the ordinary rolls, may be employed where it is deemed desirable.

REPORT FROM CORNWALL.

July 4.—There is no change again worthy of note in the conditions of mining enterprise so far as the rate of produce is concerned, and we are still, like the celebrated Mr. Micawber, waiting for something to turn up. We have already waited long, and may have to wait some time longer, but the prospects do appear a little brighter, although in some quarters despondency does seem to reign supreme. We are glad to find, too, that the art of boring machinery is steadily extending. West Tolgus, which by the way is looking even better than ever, has started machine boring, and a couple of Ingersoll drills are now in course of erection at Drake Walls. These are among the best indications we can have of life and progress.

For the time, at least, we shall now be one tin smelting concern the less. The Bissoe Works are to be shut up, and if the firm do resume tin smelting it will be in Wales, and not in Cornwall. Is this any indication that hereafter tin smelting may, like copper smelting, leave the county altogether? Messrs. Tregoning announce their determination in the following circular:—"For some time past the state of the tin trade has been such as to create anxiety in the minds of all connected with Cornwall, and we can no longer hide from ourselves the fact that the return from our business at Bissoe is altogether inadequate to the labour and expenditure incurred in conducting it. We have, therefore, determined to give up possession of the smelting house, and after to-day we shall—for a time at least—cease to be purchasers of tin ore; we say 'for a time' because, after 30 years' experience of the trade, we shall leave it with great reluctance, and when the result of foreign competition on the mines of Cornwall is more clearly defined, it is not improbable that we may erect furnaces here in connection with our tin-plate works. In notifying to you our proposed retirement from Bissoe, we desire, also, to thank you for the services which you have so kindly rendered to our firm in the past, and to request that in the event of your having any communication to make to us, it may be sent to this address." This does not look like very much confidence in the future, but still it is not an absolute retirement. There is very little prospect that any of our mines will try to take advantage of the opportunity, and smelt on their own account—in fact, there is none at all for the present.

The differences at Devon Consols are unfortunately bearing outside fruit. At Gawton, where the calendar month system of pay was in force, the men have been earning good wages, and were reasonably content with the conduct of affairs; at least, they made no objection to it. Now, however, that the five-weeks month controversy has been raised and fought out at Devon Consols, matters seem to have changed. The Gawton men are no longer contented to go on as they have been going, and have consequently got up a memorial asking to be paid every four weeks, according to the system now current. It is too early to say definitely what the results of this movement may be, but there are hopes that it will be settled amicably.

Killifreth has come somewhat to grief under the Metalliferous Mines Act, Dr. Foster having had the unpleasant duty of bringing the agents before the magistrates for five distinct offences—First, for neglecting to cause ladders in a working shaft to be placed at the most convenient angle; neglecting to have the shaft properly fenced; for neglecting to keep in the office a proper register; for failing to keep an abstract of the Mines Regulation Act, 1872, with the name and address of the Inspector of the district, and the owner and agent of the mine, posted up; and for failing to keep a proper plan of the mine. The evidence was clear enough, and the Rev. T. Phillpotts, the Chairman of the Bench, said he thought there had been gross neglect throughout, and he was sure Dr. Foster would not bring a case forward that he did not think was necessary for public safety; he thought the worst case was the ladders, which seemed to be very dangerous, and they would, therefore, inflict a penalty of 5*l.* for that and 1*l.* for each of the other cases, the defendants to pay the fines and costs between them.

The evidence with regard to the ladders may be of importance in its bearing upon the practice in other mines, and we, therefore, note the chief points. The Metalliferous Mines Act enacts that all ladders fixed in a shaft shall not be vertical or overhanging, and shall be inclined at the most convenient angle which the space in which the ladders is fixed allows, and that every such ladder shall have substantial platforms at intervals of not more than 20 yards. Notice had been given to the agents in January calling their attention to these ladders being too steep, and on June 6 Dr. Foster, the Government Inspector, again visited the mine, and found the angle was still the same. Dr. Foster, when called, said the best angle was about 20° from the vertical, or as the men called it, 2 ft. in the fathom. In this shaft they could not get as much angle as that, but they could get a very much larger one than they had at the time he visited the mine. By such an angle as they had the men were more liable to fall away from the ladders, and there would be more fatigue in climbing them; besides this, there was a manhole at the foot, and the men were liable to be precipitated very much further than they would be if the ladders were arranged differently. There was another permanent way which was mostly used by the men, but this was equally as bad as the shaft referred to.

Capt. Michell, on the other hand, deposed that the ladders were placed in the most convenient angle that the shaft would admit of. The angle had not been altered for the last six months. He had had 30 years' experience as a miner. The shaft was never intended as a footway, and the ladders were put there for the convenience of the men sinking the shaft. There was a permanent way in the engine-shaft, and this was the most convenient, the best, and the shortest way for the men. Six months in the year men could not go through the new shaft because it was so wet; the shaft, however, was open to the miners to go through if they liked. Capt. Paul added that the shaft was never used at all before Dr. Foster came there, but had been used during the last two or three weeks since the weather had become dry. However, it will now be clearly seen that the Act must be strictly complied with, and that if ladders are not intended to be used they had better not be put in.

TRADE OF THE TYNE AND WEAR.

July 4.—On the whole the coal and iron trades continue extremely dull, the only feature of a cheering nature being steam coal, the shipments of which have been considerable. Upwards of 30,000 tons of steam coal were exported from Blyth Harbour during last week, the largest quantity that has been shipped here for many years. Great depression continues to prevail in the Durham coal trade. Half-time is now being worked at the Byrnes, Littleburn, Brandon, Brancepeth, and Oakenhaw Collieries. At Littleburn and the Brownley Collieries a large portion of the miners employed have been served with notices to terminate their engagement. A general reduction of 10 per cent. is expected will shortly be made through the collieries in North Durham. It will be recollected that the inundation at the Hetton Collieries occurred on March 6, when a man was drowned or killed by an escape of gas and water from old workings. The body of the poor man, Jos. Davidson, was only recovered after the removal of the water on Tuesday. The inquest was opened on Thursday, but was adjourned for a week.

Many extensive new works have been constructed lately by the North-Eastern Railway. The Byker and Tyne Side railway branch has cost upwards of 300,000*l.*, and this is near completion. The Castle Eden and Stockton branch is also near completion, having cost 305,500*l.* In the railways and new station at York 363,000*l.* has been expended, and 30,000*l.* more is expected to complete them.

Extensive and costly works have also been in progress some time at Sunderland. These comprise a new high-level bridge over the Wear, the formation of a central station at Bishop Wearmouth, and railway branches to connect the various lines. Great progress has been made with those works, and when they are completed the improvements will prove of great importance to the town and ports of Sunderland.

At Middlesbrough, on Tuesday, the market opened quietly, and was thinly attended until towards the close. The sales made were not by any means numerous, but there were many enquiries, both for forward and prompt delivery, at the current rates—No. 1, 40*s.* 6*d.* to 43*s.*; No. 3, 33*s.*; No. 4, forgo, 33*s.* to 33*s.* 3*d.*, less 1 per cent. commission. The makers are in many cases asking 39*s.* 6*d.* for No. 3, but buyers, though they will give 39*s.*, do not seem prepared to advance further. Enquiries for forge iron continue, which show that there has been no diminution of work at the local mills; there is, in fact, a prospect of more work being brought into the district by the starting of the Britannia Works at Middlesbrough. The Quarterly Meeting, which is to be held next week, is looked forward to, as it is hoped by that time the prospects will have to some extent improved in the manufactured iron trade. In bridge building, engineering, and similar classes of work, there are indications from the enquiries being received of more work as being like to come to hand. It will take some time, however, for a very marked impression to be made on this class of trade, especially in bars and angle-iron. There are a few enquiries for iron rails, but they are very limited, and confined chiefly to light descriptions, which range from 5*l.* 12*s.* 6*d.* to 5*l.* 15*s.* The heavy rail trade, if there be an order, stands no chance in this district against Wales. Plates continue in quiet request, and prices are 6*l.* 2*s.* 6*d.* Sheets and boiler-plates in fair demand, the former at 7*l.* 15*s.* to 8*l.*, and the latter at 7*l.* 2*s.* 6*d.*, less commission. The foundry trade is improving, if taken generally, though ordinary castings are not much enquired for.

The Durham miners' gala is to be held on Saturday next at the usual place in Durham, when a large number of men will, no doubt, attend, and it is expected the speakers will cause the meeting to be very interesting and useful. Several members of Parliament are expected to attend.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

July 4.—Reports received from the lead mining districts show that little change has taken place of late in the business being done, whilst so far no new ground is being broken or abandoned mines reopened. No doubt those who wish to invest would do best with respect to the latter, for there are many that would repay those who by a moderate outlay of capital brought them again into working operation. However, there are still a few that are doing well, showing that, although lead has been working for many hundreds of years in Derbyshire, the supply is far from being exhausted. At one time there was a fair number of ironstone mines in the county, so the Derbyshire pig was made from the ore found within the county, but for some years past this has not been the case, for more is now being imported than is raised at home. Northamptonshire is the principal provider, and some of the ore there is certainly of excellent quality, and if carefully selected would produce along with the local ore a high quality of pig. Lincolnshire ore is now being used at one of the largest establishments, but it is, also, of a variable character. Yet it has the great advantage of a large percentage of lime in it, sufficient, probably, for fluxing. Still the pig scarcely commands the price in the markets that it ought to do, for whilst a few days since the South Yorkshire was quoted at 57*s.* 6*d.* per ton, Derbyshire was put down as low as 52*s.* 6*d.*, and a difference of 5*s.* a ton is a most important one just now. Some of the South Yorkshire makers, it may be said, obtain ore from both Northamptonshire and Lincolnshire. In manufactured iron business is still quiet, whilst the foundries are working steadily. House coal has undergone no material change since last notice, being difficult to sell, whilst prices are particularly low and unremunerative, and as the collieries are not working more than three or four days a week, no improvement can be expected during the next two months at least. Consumers do not care to fill their cellars in summer so as to save a few shillings, not even in London, although they have even now to pay three times as much for their coal as is paid for it at the pits. This is a difference that certainly should not exist, but no doubt it will do so as long as the greater part of the trade is left in the hands of the merchants, who make money whilst the colliery owners lose theirs.

Some little change of late has taken place in the Sheffield trades, yet many of them are still only partially employed. Bessemer rails still take the first place, and the makers are well supplied with orders for home and foreign lines. But railway companies are now aware of the fact that during the last year or two there has been an increase in the number of makers, which has had the effect of bringing down prices, so that profits are very moderate indeed. Some descriptions of crucible steel are in rather better request, and a few orders are in hand on Government account. Russia is again becoming a good customer, and whilst the Congress has been sitting some extensive purchases have been made for that country. The heavy and other plate-mills are now comparatively quiet, and orders for shipbuilders have fallen off of late. As usual at this time of the year agricultural implement makers are well off for business, but, on the other hand, the locomotive and machine shops are doing comparatively little, some of them not more than three days a week. A few of the principal cutlery houses are working tolerably well in the best goods, but the majority of them are still on short time. Girders are being sent over to this country from Belgium, and we are unable to compete with them in price, yet, strange to say, we have been able to beat them in markets close to them in Bessemer rails. The foundries have been kept fairly going, and the new design in stoves and grates has been the means of some good orders being sent into the town and the neighbourhood as well. In South Yorkshire the coal trade is still dull, and prices low, so that as a rule the colliery owners are losing money on the business they are doing. In house coals only a moderate tonnage is being sent to London over the Great Northern, in a great measure due to the existing rate, and no improvement is looked forward to until the company thinks well to make a reduction, which has been urgently requested. Shipments of steam coal from Grimsby have been considerably lower than for the corresponding period of last year, Russia having been by far our best customer from that port.

A movement has been commenced in South Yorkshire for reducing miners' wages, and the men appear to be aware that such is inevitable, for those at Wharfedale Silkstone, who had notice to leave, agreed to meet the employers yesterday, and it is expected that they will make a satisfactory concession and continue at work. At the Dodworth Silkstone Colliery, near Silkstone, where the men have been on strike for some time, there has been no change, all the hands employed being non-Unionists. The men on strike, however, have shown a disposition to come to terms, but the manager does not intend to discharge any of those at present at work, most of whom are making good wages, and are perfectly satisfied with their position.

The trial of a large locomotive steam crane, built by Mr. Thomas Smith, Steam Crane Works, Rodley, near Leeds, took place on Wednesday, at the quarries of Mr. Joseph Bradley, Meanwood. The trial, which was carried out under the personal supervision of Mr. Smith, was witnessed by a large number of quarry owners and stone merchants, who were much pleased with the manner in which the crane did its work. The crane is made to hoist, propel, and revolve, simultaneously or separately, as desired; thus a stone can be hoisted out of the quarry, and at the same time travelled to any position required.

At the Midland Institute of Mining, Civil, and Mechanical Engineers annual meeting at Barnsley, on Wednesday, Mr. Embleton, the President, made some experiments, and explained a test with regard to safety-lamps before they were given to the miners at the collieries. The test, which is similar to that in operation at some of the West Riding collieries, consists of a lamp being placed in a perforated circle of gas-pipes, and an india-rubber tube was then attached to the gas-pipe, and the lamps were submitted to the gas when lighted, and only two of them stood the test, and went out,

none of the others standing the test for more than 20 seconds. A lamp used in the experiment was thought to be perfect, but owing to a defect it failed to stand the test, and the lamp which had been in use at the Blantyre Colliery, Scotland, the scene of the recent explosion, was tested, and fired in the interior of the lamp rather quickly. Several members who witnessed the experiments expressed themselves in unqualified terms at the knowledge they had obtained, the experiments being allowed to be amongst the most important which have yet been made in connection with mining operations. The President expressed an opinion that the explosion at the Haydock Colliery was the result of a defective lamp, and the experiments showed how exceedingly difficult it was to detect a small defect. It was stated that a similar system of testing the lamps was in operation at Rothwell Haigh Colliery, near Wakefield, and if this plan could be more extensively adopted no defective lamp could pass into the workings, and in all probability many of the large and disastrous explosions which have taken place would be unknown. The experiments were watched with considerable interest by those present.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

July 4.—Business is largely postponed until the Quarterly Meetings. Upon those occasions everything will depend upon what action the Shropshire pig makers may take, as if they should reduce prices the Staffordshire houses will have to follow, and finished iron will then naturally fall. The reduced wages which some of the Shropshire colliery owners have recently got the men to accept is not unlikely to have an easing effect upon pigs made in that district. At the present time all orders are being given out alike as to coal and iron, subject to Quarter-Day prices. The works and collieries are this week in fair operation upon old orders. Furnace and forge fuel is easy, and consumers were hardly ever more favoured than now in the matter of the number of hundredweights to the ton, and of the number of tons to the boatload.

It is satisfactory that no large firms in this immediate district are likely to be affected by the failure of Messrs. H. B. Whitehouse and Son, of the Priorfield Furnaces, Deepfields, who have issued a circular asking the indulgence of their creditors. The chief creditors outside the banks lie in North Staffordshire. The books of the firm are now being examined by public accountants, who will prepare a statement necessary to the filing of the petition and to the calling together of the creditors. Before this is all completed some three weeks may, perhaps, elapse. The firm own three blast furnaces, which have up to recently been all blowing, and they also own and lease extensive collieries. It is one of the oldest in the district, having been founded about 50 years back by Mr. H. Bickerton Whitehouse, since whose death about seven years ago, Mr. Benjamin Whitehouse, his eldest son, has had the management of the concern. Much sympathy is expressed for the firm, which is universally respected, and although it had been known for some time that the concern was involved, yet it had been hoped that it would have been able to withstand the unprecedentedly lengthy period of depression to which it has now been compelled to succumb. The liabilities will, it is expected, be between 50,000*l.* and 100,000*l.* The assets are considerable.

A petition in liquidation has been filed by Mr. Samuel Hipkins, ironfounder, Dudley Port, with liabilities estimated at about 16,000*l.*, and the assets at 10,000*l.* or thereabouts. The firm is not of much importance, and no anxiety is occasioned by the suspension.

A monthly meeting of the Mines Drainage Commissioners was held in Wolverhampton on Wednesday, when a resolution was passed requiring every occupier of a mine within the drainage area to make a return, for the purpose of rating, of the number of acres occupied by him, and of the tonnage of minerals raised during the half-year just ended. Sums on general and mines drainage account, amounting to 2700*l.*, were also passed for payment.

Interest is displayed in this district that the Queen's Bench division, in an appeal by the Government Inspector of Mines for the district, should have upheld the plea of the Spon Lane Colliery Company, that in negotiating for the purchase of property near to their colliery, upon which was a large "pound," that imperilled the lives of the miners at the Spon Lane Colliery, the company were fulfilling the Inspector's notices to take steps to remedy the evil, and need not at once have stopped operations.

In North Staffordshire the demand for fuel of all sorts remains dull, and the pits are doing very little. Prices are weak. Finished iron orders are scarce. Steel rails are selling, but not briskly, and prices are very low.

NORTH STAFFORDSHIRE IRON AND COAL TRADES.—The quarterly meeting of the North Staffordshire Iron and Coal Masters Association was held on Thursday, at Hanley, Mr. F. Wragge in the chair. It was stated that a better feeling pervaded the trade, but no actual improvement in prices had been secured. The business transacted was of a limited character. The meeting considered the Valuation Bill in its relation to the assessment of coal and ironstone mines, and also a report of the action taken by the Mining Association of Great Britain in reference to the bill, and on the subject of employers' liability for injuries to servants. A report was submitted of the proceedings which have taken place in respect to the action brought by the Chatterley Iron Company against the North Staffordshire Railway, and an opinion was generally expressed that the railway company should abandon their attitude of hostility to the traders, and agree to fair and amicable arrangements as to the traffic of the district, upon the prosperity of which the company are dependent for their own revenue.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

July 4.—Allusion has been frequently made to the Bill for connecting the port of Newport with the Rhondda Valley by a direct line of railway. The measure, called the Pontypridd, Caerphilly, and Newport Railway Bill, has already passed the House of Commons, and during the last few days has been before a Committee of the Lords. To-day the news reached the district that the preamble of the Bill had passed. This is, however, subject to a clause giving the Alexandra (Newport) Dock Company power with regard to subscribing, working, or controlling the railway being struck out. Alterations, too, are to be made so as to ensure the rates for coal and iron being the same as the maximum rates of the Taff Vale. The Bill was strongly opposed by the trustees of the Marquis of Bute. It is an important one for Newport, as it will open up to the port the traffic of the rich mineral district of the Rhondda Valley. The facilities now afforded by the Alexandra Dock are being increased, and last month the quantity of coal shipped from this dock was over 20,000 tons above what has ever been cleared in a similar period. The Swansea folk are very much annoyed at the consent to use steam on the Oystermouth branch of the local tramways being refused. Besides that, they are indignant at the action taken by two local members of Parliament, Mr. Dillwyn and Mr. Vivian, who in the House opposed the general principle of the introduction of steam on tramways. These gentlemen are to be asked to meet their constituents in public meeting. A petition is to be forwarded to the House of Lords on the matter, and it is said that the company intend to appeal against the decision of the Vice-Chancellor.

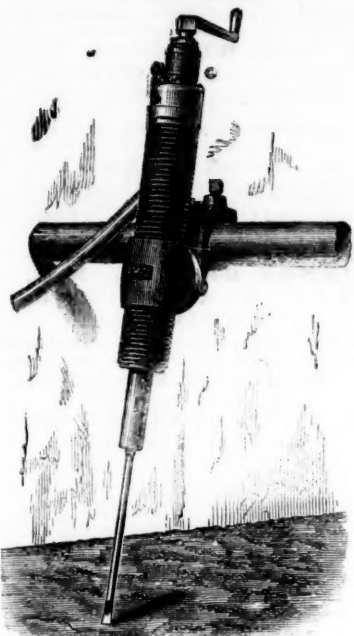
There is still more activity observable at several of the local iron-works, and India continues a good customer, as well as Australia. Clearances have gone, and are going, forward in both the directions. At Dowlais the amount of work in hand is fairly good as times go, and the same remark applies to two or three more of the local establishments. The continental demand is not brisk, and the orders in hand are mostly small in extent. The great cry is still as to the low prices, and no doubt orders would often be refused were it not for the sake of keeping up old connections. The demand for railway iron is comparatively unaltered, and that for bars is not at all active. Transactions in pig-iron are said to be a little more numerous. At most of the steelworks there is a moderately good amount of work in hand; the demand runs mainly in the direction of rails; but these have to be made at a rate which used to be considered low for iron rails. The Tin-Plate trade does not manifest any improvement. Prices are unsatisfactory, although it is reported

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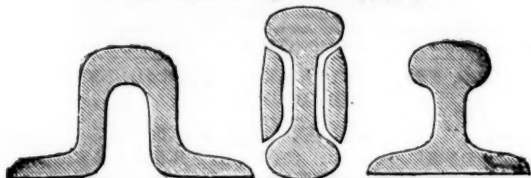
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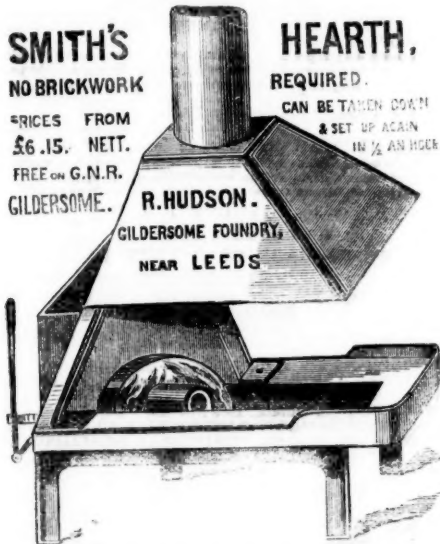
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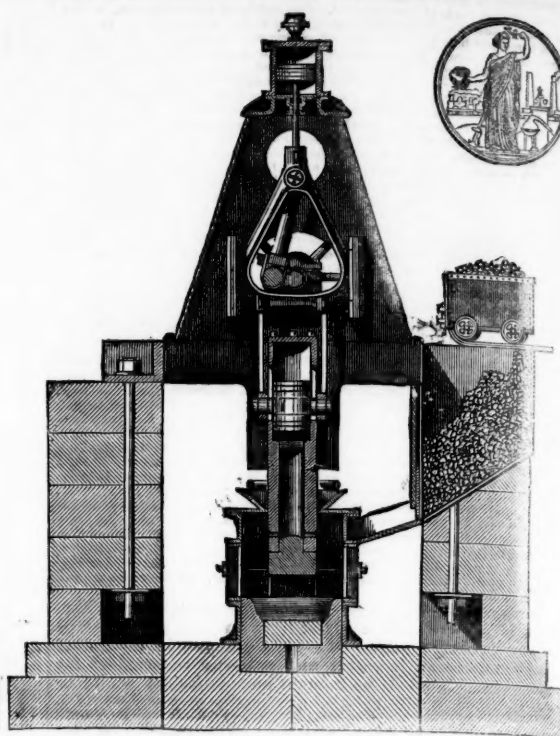
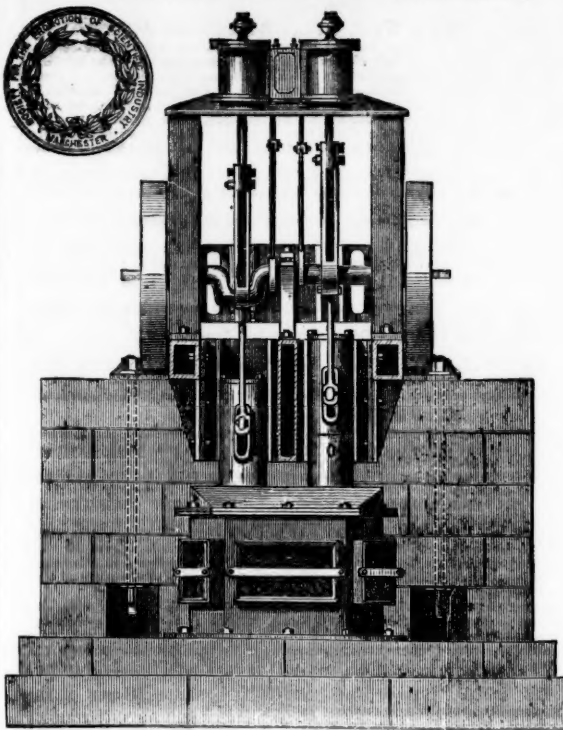
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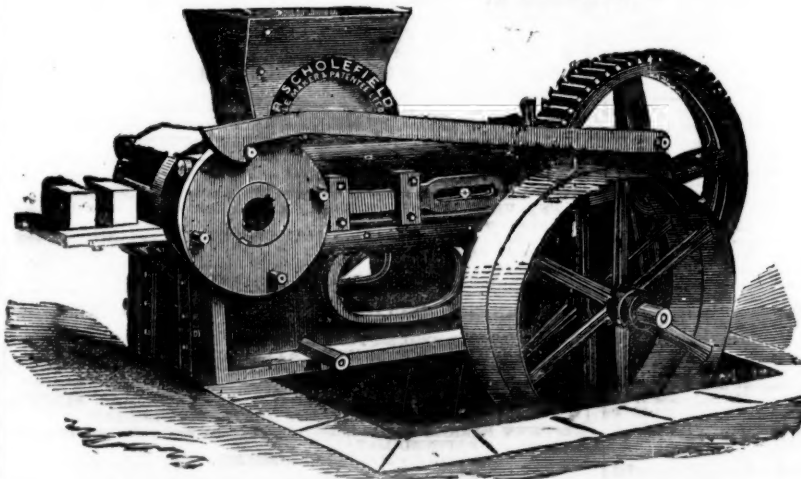
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THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.

Shares.	Minas.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
1500	Alderley Edge, c, Cheshire*	10 0 0	—	—	12 11 8	0 5 0	Jan. 1876
4000	Brookwood, c, Buckfastleigh	1 16 0	—	—	3 16 0	0 2 0	Nov. 1875
1000	Carn Brea, c, t, Illogan†	36 7 6	—	—	0 7 0	0 7 0	Nov. 1877
3000	Bryn Alyn, c, t, Denbigh	10 0 0	—	—	1 9 6	0 2 0	Aug. 1876
400	Cashwell, c, t, Cumberland*	2 10 0	—	—	308 0 0	1 0 0	Feb. 1874
1000	Carn Brea, c, t, Illogan†	36 7 6	—	—	11 17 0	0 7 6	Jan. 1873
2450	Cook's Kitchen, c, t, Illogan†	24 4 9	—	—	116 15 0	0 5 0	July 1877
10240	Devon Gt. Consols, c, Tavistock†	1 0 0	—	—	112 11 8	0 5 0	June 1878
4266	Doleath, c, t, Camborne	10 14 10	—	—	0 10 0	0 10 0	Feb. 1877
8000	East Black Craig, c, t, Scotland	8 0 0	—	—	285 10 0	1 0 0	Aug. 1876
800	East Darnley, c, t, Cardiganshire	32 0 0	—	—	15 9 3	0 2 6	May 1878
4000	East Pool, c, t, Illogan†	0 9 9	—	—	0 13 4	0 0 6	Feb. 1878
40000	Glasgow Carron, c, t, 10,000 15s. p. j.	13 1 1/2	—	—	0 5 0	0 5 0	Aug. 1877
7600	Gorsedd and Merlyn Cons., c, t, Flint	2 10 0	—	—	0 2 6	0 2 6	Apr. 1876
18000	Great Dyffryn, c, t, Montgomery	4 0 0	—	—	23 11 0	0 8 0	Apr. 1878
15000	Great Lacey, c, t, Man*	4 0 0	—	—	0 1 6	0 1 6	May 1876
615	Gt. Retallack, c, t, Penrynabuloe	18 6 6	—	—	0 18 0	0 3 0	Mar. 1878
6400	Green Hurth, c, t, Durham	0 6 0	—	—	0 14 0	0 2 0	Jan. 1878
20000	Gronowion, c, t, Cardigan	3 0 0	—	—	0 13 9	0 1 0	Oct. 1876
9830	Gunnislake (Clitters), c, t, t	8 5 0	—	—	0 4 6	0 0 6	Sept. 1877
60000	Holmbush, c, t, s, Callington†	1 0 0	—	—	82 5 0	0 10 0	Feb. 1876
2800	Isle of Man, c, t, Isle of Man†	25 0 0	—	—	0 15 0	0 3 0	Mar. 1878
30000	Llanidloes, c, t, s, Llanidloes	6 0 0	—	—	568 10 0	1 0 0	May 1878
400	Liburne, c, t, Cardiganshire	18 10 0	—	—	0 9 0	0 4 6	Nov. 1876
14000	Llanidloes, c, t, s, Llanidloes	3 0 0	—	—	7 15 0	0 2 0	Jan. 1876
9000	Marke Valley, c, t, Llanidloes	5 3 8	—	—	0 5 0	0 3 0	July 1878
10000	Merioneth Copper, Hayle*	2 0 0	—	—	67 13 2	0 2 6	May 1878
3000	Minera Mining Co., c, t, Wrexham*	5 0 0	—	—	23 17 6	0 2 6	Jan. 1878
3000	Minera Mining Co., c, t, Wrexham*	5 0 0	—	—	1 10 0	0 1 0	July 1877
444	North Bary, c, t, Chacewater	3 9 6	—	—	0 1 0	0 1 0	Feb. 1877
10000	North Hendre, c, t, Wale	2 10 0	—	—	0 9 0	0 9 0	June 1877
30000	Panty Mwyn, c, t, Wale (8794 iss.)	2 0 0	—	—	0 10 0	0 10 0	June 1877
6000	Pedn-ar-dra Con., c, t, Redruth	0 8 6	—	—	0 18 0	0 3 0	July 1877
6000	Penhalls, c, t, St. Agnes	3 2 6	—	—	0 18 0	0 3 0	July 1877
6000	Pennant, c, t, St. Agnes	5 0 0	—	—	0 10 0	0 10 0	Nov. 1878
45793	Pennant, c, t, St. Agnes	2 0 0	—	—	0 2 8	0 2 8	Nov. 1878
18000	Prince Patrick, c, t, s, Holywell	1 0 0	—	—	0 14 0	0 1 3	Jan. 1876
10000	Red Rock, c, t, Cardigan	2 0 0	—	—	0 4 0	0 2 0	Jan. 1878
12000	Roman Gravel, c, t, Salop†	7 10 0	—	—	7 15 0	0 5 0	Mar. 1876
513	South Cardon, c, t, St. Cleer	1 5 0	—	—	742 10 0	1 0 0	Mar. 1878
6123	South Cardon, c, t, St. Cleer	6 6 6	—	—	3 13 0	0 8 0	Apr. 1878
12000	St. Harmon, c, t, s, Llanidloes	3 0 0	—	—	0 6 0	0 3 0	July 1877
1000	St. Pr. Patrick, c, t, s, Llanidloes	1 0 0	—	—	0 7 0	0 1 0	Oct. 1876
1000	Tankerville, c, t, Salop†	6 0 0	—	—	4 17 0	0 5 0	Dec. 1876
6000	Tinroft, c, t, Pool, Illogan†	9 0 0	—	—	50 8 6	0 3 0	May 1877
15000	Van, c, t, Llanidloes	4 5 0	—	—	23 0 6	0 3 0	July 1878
3000	W. Chiverton, c, t, Penrynabuloe	12 10 0	—	—	55 10 0	0 10 0	Feb. 1878
1123	West Poldice, c, t, St. Agnes	10 0 0	—	—	1 19 0	0 4 0	July 1876
412	West Tolgus, c, t, Redruth	95 10 0	—	—	29 15 0	0 10 0	July 1878
2048	West Wheel Franchises, c, t, Illogan	28 1 3	—	—	3 12 6	0 5 0	Oct. 1872
600	West Wheel Franchises, c, t, Illogan	47 0 0	—	—	448 0 0	0 15 0	Apr. 1878
12000	West Wheel Franchises, c, t, Illogan	3 0 0	—	—	0 12 0	0 3 0	Nov. 1877
1024	W. Eliza Consols, c, t, St. Austell	18 0 0	—	—	18 0 0	1 0 0	Apr. 1878
2048	Wheal Jane, c, t, St. Agnes	2 13 10	—	—	8 5 0	0 5 0	July 1876
4266	Wheal Kitty, c, t, St. Agnes	5 4 8	—	—	11 19 0	0 2 6	Dec. 1876
25000	W. Newton, c, t, s, Llanidloes	95 15 0	—	—	8 5 0	0 4 0	Aug. 1872
80	Wheal Owles, c, t, s, Llanidloes	7 11 0	—	—	0 5 0	0 5 0	Apr. 1878
3000	Wheal Fawcett, c, t, Redruth	0 5 0	—	—	0 4 0	0 1 0	July 1877
6000	Wheal Frusis, c, t, Redruth	0 5 0	—	—	0 10 0	0 4 0	Oct. 1876
10000	Wye Valley, c, t, Montgomery	3 0 0	—	—	0 10 0	0 4 0	Oct. 1876

FOREIGN DIVIDEND MINES.

25500	Alamillos, <i>l</i> , Spain†	2 0 0	...	1½	...	1 1½	...	1 19 3...	0 1 0	April 1878
80000	Almaden and Tinto Consol, <i>s</i> †	1 0 0	...	2½	...	¾	...	0 6 3...	0 1 0	May 1876
20000	Australian, <i>c</i> , South Australia†	7 7 8	...	2	...	1½	...	0 19 6...	0 1 6	July 1877
10000	Battle Mountain, <i>c</i> , <i>c</i> (2240 part pd.)	5 0 0	...	—	...	—	...	0 10 0...	0 10 0	Nov. 1872
15000	Birdseye Creek, <i>c</i> , California*	7 0 0	...	32	...	30 32	...	0 14 0...	0 2 6	June 1874
20000	Cape Copper Mining, <i>c</i> , So. Africa	7 0 0	...	—	...	—	...	31 7 6...	0 17 6	June 1878
24432	Cedar Creek, <i>c</i> , California*	5 0 0	...	¾	...	¾ ¾	...	0 8 0...	0 2 6	June 1872
80000	Cesena Sul. Co. Romanga, Italy*	10 0 0	...	—	...	—	...	0 10 0...	0 3 0	Aug. 1877
15000	Chicago, <i>c</i> , Utah*	10 0 0	...	1	...	¾ 1	...	2 8 0...	0 4 0	Nov. 1876
65000	Colorado United, <i>s</i> , Colorado*†	6 0 0	...	6	...	6 0½	...	0 18 6...	0 4 0	Jan. 1877
10000	Copio, <i>c</i> , Chili† (240 shares)	19 15 0	...	—	...	—	...	7 11 5...	0 3 0	May 1877
00000	Don Pedro North del Rey*	0 10 0	...	¾	...	¾ ¾	...	2 8 9...	0 2 0	Mar. 1872
25500	Eberhardt & Aurora, <i>s</i> , Nevada*	10 0 0	...	6½	...	6½ 7½	...	1 8 0...	0 3 0	Dec. 1877
70000	English & Australian, <i>c</i> , St. Aust.	2 10 0	...	1½	...	1½ 1½	...	2 15 9...	0 1 0	Mar. 1877
80000	Flaetaff, <i>c</i> , Utah*	10 0 0	...	¾	...	¾ ¾	...	4 2 0...	0 5 0	July 1878
25000	Fortuna, <i>l</i> , Spain†	2 0 0	...	—	...	4½ 5	...	6 19 0...	0 5 0	Apr. 1878
55000	Frontino & Bolivia, <i>g</i> , New Gran.*†	2 0 0	...	2½	...	1¾ 2¾	...	0 1 0...	0 1 0	Oct. 1876
80000	Gold Run, <i>hyd.</i>	1 0 0	...	—	...	—	...	0 2 4...	0 0 6	Oct. 1877
85000	Kapunda Mining Co. Australia†	1 0 0	...	—	...	—	...	0 2 4...	0 0 6	June 1878
20000	Las Chancas, <i>s</i> , Utah*	8 0 0	...	1½	...	1½ 1½	...	0 14 0...	0 2 0	July 1878
15000	Llanidloes, <i>l</i> , Spain†	8 0 0	...	¾	...	¾ ¾	...	17 10 0...	0 5 0	Apr. 1878
85000	London and California, <i>c</i> , t, Spain†	2 10 0	...	¾	...	¾ ¾	...	0 1 0...	0 1 0	July 1878
7837	Llanidloes, <i>c</i> , t, Spain†	3 10 0	...	—	...	—	...	1 11 8...	0 1 8	Mar. 1878
80000	Mammoth Copperopolis of Utah, <i>c</i> , <i>l</i>	10 0 0	...	—	...	—	...	0 5 0...	0 5 0	Dec. 1877
8000	Mountain Chief, <i>c</i> , Utah*	10 0 0	...	—	...	—	...	0 4 0...	0 4 0	Jan. 1878
10000	Pontbiquand, <i>s</i> , <i>l</i> , France†	20 0 0	...	27	...	25 27	...	25 8 0...	0 11 0	Nov. 1877
100000	Port Phillip, <i>g</i> , Clunias†	1 0 0	...	¾	...	¾ ¾	...	1 10 0...	0 1 0	Jan. 1878
64000	Richmond Consols, <i>s</i> , Nevada*†	5 0 0	...	13	...	12 12½	...	4 11 6...	0 7 6	May 1878
40000	Santa Barbara, <i>s</i> , Brazil	0 10 0	...	1½	...	1 1½	...	0 4 9...	0 1 0	Apr. 1878
120000	Scottish Australian Mining Co.,*	1 0 0	...	2	...	1½ 2	...	15 per cent.	...	May 1878
95000	Scottish Austral. Mining Co.,*	0 10 0	...	¾	...	¾ ¾	...	15 per cent.	...	May 1878
112500	Sierra Buttes, <i>g</i> , California*	2 0 0	...	2	...	1½ 2½	...	1 18 0...	0 2 0	Oct. 1877
40000	South Aurora, <i>c</i> , Nevada*	5 0 0	...	¾	...	¾ ¾	...	0 14 2...	0 2 0	Nov. 1872
253000	St. John del Rey† (25 stock & multiples dealt in)	3 0 0	...	—	...	—	...	¾ year, 17½ p. c.	...	for June 1878
20000	Tolima, <i>g</i> , So. America	5 0 0	...	—	...	—	...	0 11 6...	0 6 6	May 1874
25000	Victoria (London), <i>g</i> , Australia	1 0 0	...	¾	...	¾ ¾	...	0 12 6...	0 0 7	Jan. 1878
15000	Western Andes, <i>s</i> , New Granada	8 0 0	...	—	...	—	...	0 12 0...	0 12 0	July 1876
91000	W. Prussian (8500 pref. sh. 10s. pd.)	10 0 0	...	11	...	10 11	...	1 2 0...	0 4 0	July 1878

NON-DIVIDEND FOREIGN MINES.

Shares.	Minas.	Paid.	Last Pr.	Clos. Pr.	Last Call.
5000	Anguilla Phosphate, West Indies (4000 issued)	10 0 0	—	—	...Fully pd
12000	Argentine, g, Argentine Republic	8 0 0	—	—	...Fully pd
8000	Bellavista, s, Peru* (£10 shares)	10 0 0	—	—	...Fully pd
30000	Blue Tent, <i>Hyd.</i> , California	5 0 0	3½	3 3/4	...Fully pd
49935	Chontales, g, s, Nicaragua*†	2 0 0	—	—	...Fully pd
15000	Condes of Chilli, s, Victoria*	5 0 0	1½	3½ 1/4	...Fully pd
20000	English Australin, s, Victoria*	1 0 0	—	—	...Fully pd
85000	Excelsior Hydraulic Gold Washing Co., California†	6 0 0	—	—	...Dec. 187
100000	Exchequer, g, s, California*†	1 0 0	2s.	1s. 2s.	...Fully pd
40000	Holcombe Valley, g, s, California	1 0 0	—	—	...Fully pd
8000	Honachos, s, s, Spain	10 0 0	16	12 14	...Fully pd
12000	Hultafall, i, b, Orebro, Sweden	5 0 0	6	4 5	...Fully pd
12000	Hunter Consolidated, s, Utah	10 0 0	—	—	...Fully pd
20000	Imperial Brazilian Collieries, Brazil*	8 0 0	—	—	...Fully pd
00000	I. X. L., g, s, California*	1 0 0	—	—	...Fully pd
60000	Javali, g, Nicaragua*	2 0 0	9s.	7s. 9s.	...Fully pd
3500	La Manche, i, Newfoundland	10 0 0	—	—	...Fully pd
12000	Llanestosa, s, i, s, Viscaya, Spain (£2 shares)	1 15 0	—	—	...Mar. 187
75000	Malabar, g, Colombia* (67185 issued)	1 0 0	—	—	...Fully pd
40000	Malpaso, g, Colombia* (1400 pref. shares, fully paid)...	1 0 0	—	—	...Fully pd
12000	Menzenberg, g, Honnef, Germany*	5 0 0	—	—	...Fully pd
4588	New Benberg, i, i, Germany	5 0 0	—	—	...Nov. 187
60000	New Quebrada, c, Venezuela*	5 0 0	1½	1½ 1½	...Fully pd
20000	New Zealand Kapanga, g, Oromandel*	5 0 0	—	—	...Fully pd
3000	Oregon, g, Oregon, U.S. (preference shares)	4 0 0	—	—	...Fully pd
50000	Panulicillo, c, Chile* (25000 debentures)	4 0 0	—	—	...Fully pd
95000	Pestana United, g, Italy*†	3 0 0	6s.	4s. 6s.	...Fully pd
50000	Providencia and New Rosario, c, Mexico*	1 0 0	—	—	...Fully pd
50000	Rica, g, Colombia* (40000 issued)	1 0 0	—	—	...Fully pd
21,181,000	Rio Tinto, c, c, Huelva, Spain	Stock	67	65 67 xd	...Fully pd
100000	Rosa Grande, g, Brazil† (£1 share)	0 19 0	—	—	...Fully pd
90040	Russia Copper, Orenburg and Ufa*	10 0 0	—	—	...Fully pd
20000	San Pedro, c, Chile†	2 0 0	—	—	...Fully pd
10000	Silver Plume, s, Colorado*	1 0 0	—	—	...Fully pd
30000	Tecoma, s, Utah*	10 0 0	—	—	...Fully pd
43174	United Mexican, s, Mexico*†	29 0 3	—	—	...May 187
14000	Utah, g, s, Utah*	5 0 0	4	3½ 4	...Fully pd
5000	Virneberg, g, Rheinbreitbach, Germany* (22 shares)...	1 15 0	—	—	...May 187
15000	Yorke Peninsula, c, South Australia	1 0 0	—	—	...Fully pd
40000	Yorke Peninsula, c, South Australia Preference	1 0 0	—	—	...Fully pd

* Have made calls since last dividend was paid.

FOREIGN AND MISCELLANEOUS STOCKS, BONDS, LOANS, AND TRUSTS.

Closing Prices		Closing Prices	
Argentina, 1885 6 per cent.	72 74	Foreign and Col. Gov. Trust, 5 p. et.	70 75
Bolivia, 6 per cent.	26 27	Do., 5 per cent., 3d issue	67 68
Brazilian, 1885, 5 per cent.	93% 94%	Do., 5 per cent., 3d issue	67 65
Chilian, 1886, 7 per cent.	99 101 x d	Do., 1872, 4th issue	60 65
City of Providence, 5 p.c. coupon bnds	100 102	Do., 1873, 5th issue	55 60
Eastern, City preference	72 73	Peruvian, 1870, 6 per cent.	18 16%
Do., unified debt, scrip	73 75	Do., 1872, 5 per cent.	13% 14%
Do., 7 per cent., V.M.L.	85% 85%	Russian, 5% per cent. L. Mort.	96 98
Do., 5 per cent. guar.	81 84	Spanish, Quiksilver, 5 p. et.	93 98
Do., K. Daira Saiah	89% 83% x	United States Mort. Trust, 5 p. et.	93 98